June 1982

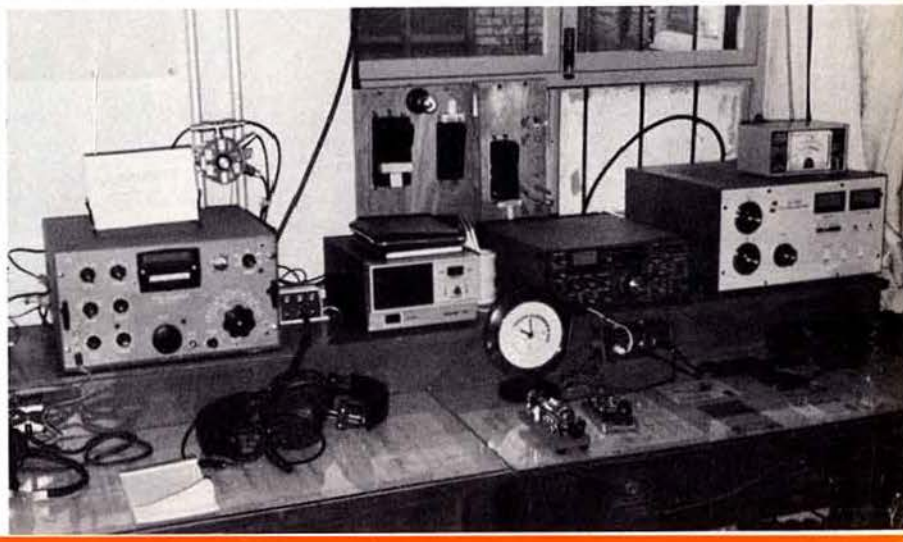
RADio COMmunication

IARU VISIT TO CHINA

Following the IARU Region 3 meeting held in Manila in early April, Noel Eaton, VE3CJ, and Dick Baldwin, W1RU, paid a visit on behalf of the IARU to Beijing (Peking), where they were cordially received by officials of the China Radio Sports Association. VE3CJ has recently retired as president of the IARU, and W1RU, recently retired IARU secretary, has been nominated to succeed him.

The photograph on the right shows the visitors with officials of the China RSA. Front (l to r): Mr Wang, deputy secretary; Noel Eaton; Mr Cheng Ping, secretary; Dick Baldwin and Mrs Baldwin. Behind and to the left of Mrs Baldwin is station manager Teng.

Dick Baldwin with Cheng Ping and Noel Eaton



The operating position at the club station of the China RSA, BY1PK, which includes an FT107 and 1kW linear. The signal feeds into a TH6 beam on a 40ft tower on the roof of the building in which the station is situated

Journal of the Radio Society of Great Britain

LOWE in LONDON

With an increasing amount of our business coming from the South of England, in particular around the London area we have, for your convenience, opened a shop in the city – not out in the suburbs but only three minutes' walk from Kings Cross Railway Station.

Now you have the opportunity to see and try out our full range of amateur, aircraft, marine and shortwave equipment before you purchase.

The shop is open from 9.30am to 5.30pm Tuesday to Friday and 9.30am until 5.00pm on Saturday.

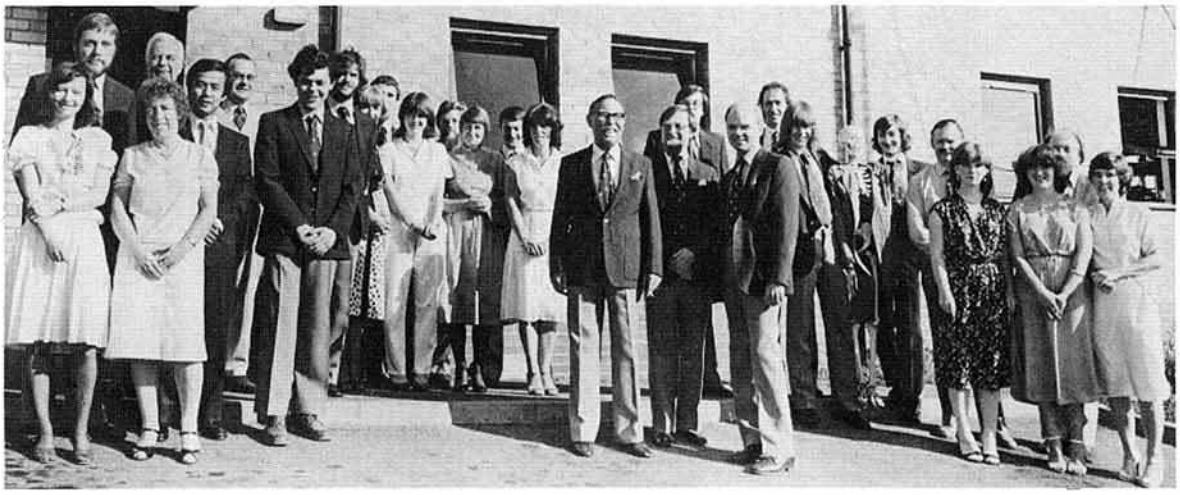
To check whether an item is in stock before your visit ring Andy on 01-837 6702 – however, please remember that all mail order and telephone sales are still being handled from Matlock.

For your added convenience, Andy is able to accept payment by Access, Barclaycard or, of course, by our very own Lowe Card.

All items purchased from London carry the renowned Lowe Electronics' guarantee and the London shop and its customers are backed by the now well-known facilities here at Matlock.

So, pay a visit to Lowe in London, situated on the lower sales floor of the Hepworth's shop at the corner of Pentonville and Caledonian Road.

tony & andy the london lads



the backup team at matlock

LOWE electronics

JUNE 1982

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All articles received are reviewed for technical merit by the RSGB Technical & Publications Committee, or an acknowledged expert on the subject, before acceptance. Payment will be made for all articles published.

The editor will be pleased to send intending authors a manuscript preparation guide and to give any other advice and assistance requested.

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Closing date for contributions unless otherwise notified: five weeks before publication date

NEW HF TRIO *pacesetter in amateur radio*

TS 930S

With the advent of amateur band transceivers/general coverage receivers in one package, the question all the inquiring Trio owners asked was "when will Trio produce their answer/equivalent to the FT-one?". We are delighted to say that it's here right now and, if previous experience is anything to go by, Trio have got it right first time (as always).

The basic package is apparently straightforward. The TS930S is all solid state, gives 120W out from transistors run from a 28V supply for "better than the rest" linearity; covers all amateur bands and general coverage from 150kHz to 30MHz; uses a built in power supply; has digital readout; has twin VFO and multi channel memory facilities and so on and so on.

What makes the TS930S stand out from the rest is, once again, the Trio attention to detail. I have always said, Trio design their equipment to be used by the average amateur, whereas some rigs look like the control panels for the space shuttle. The acid test is to sit down in front of the TS930S and compare it *in use* to anything else. Notice how the RF and AF gain controls are together, as are the mic gain and carrier level controls.

Need the variable bandwidth? Trio have come up with the most versatile system ever, with completely independent adjustments for the upper and lower sides of the filter passband, so you can have any bandwidth you like anywhere around the signal you want—think about it.

Now switch on and operate on 14MHz. So simple, just touch the button marked 14. Need to go to 21? Just push the button marked 21. Compare that to some rigs which need four hands and a degree in computing science to even get switched on!

What about general coverage? Equally simple using the 1MHz step buttons. If you are on 14MHz and you need to listen to the 15MHz broadcast band just touch the 1MHz UP button and there you are. Keep going and you step right through the spectrum in 1MHz bands.

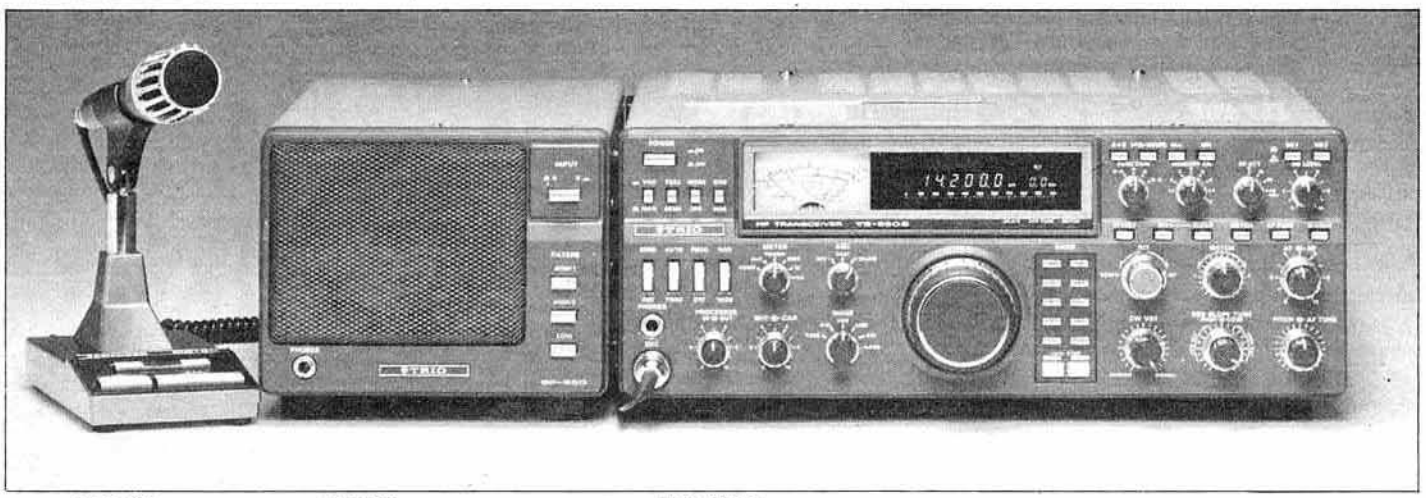
Now just mention some of the other features, look at the display which is bright white on a black background. Frequency readout is to 100Hz whilst the synthesiser tunes in 10Hz steps for true "VFO feel". Also included in the display are an analogue dial and the R.I.T. offset in kHz away from dial frequency.

The memory facilities not only remember frequency but also mode in use, and because of the operating simplicity of the TS930S, you don't have to fill the memories with the amateur bands. RF speech processing is fitted together with tunable audio filtering and full break in keying for the real CW operator. The noise blanker system has switchable gate times to cope with not only impulse noise but also the infamous "woodpecker". *And it works.*

Finally, there is provision for fitting *internally* a fully automatic aerial tuner for the amateur bands.

Alan, just back from Tokyo where he tried out the 930, is walking about in a daze muttering, "I've got to have the first one." Judging by his impressions of the rig, it's simply fabulous and we can't wait. By the time you read this, we should have them on show (and in use), so come, see, try out the new leader in HF rigs. The family is now completed from TS130S/V through TS530S, TS830S to the amazing TS930S. There is now a rig to suit everyone in the Trio range.

TS 930S £1,078.00 inc VAT
AT 930 £125.00 inc VAT
carriage £5.00

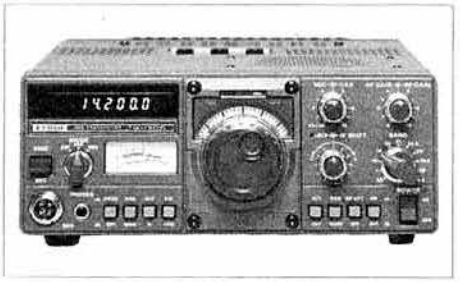


MC 60 SP930 TS 930S

TS 930S AMATEUR BAND TRANSCEIVER WITH 100KHz to 30MHz GENERAL COVERAGE RECEIVER

TS 830S
£694.30 inc VAT carr £5.00

TS 530S
£543.98 inc VAT carr £5.00



TS 130S
£529.09 inc VAT carr £5.00

LOWE ELECTRONICS Ltd
CHESTERFIELD ROAD MATLOCK DE4 5LE TEL 0629 2430/2817

NEW *from Trio for 1982*

The R-600 is a high performance general coverage communications receiver covering 150kHz to 30MHz in 30 bands, at an affordable price. Use of PLL synthesized circuitry provides high accuracy of frequency with maximum ease of operation.

R-600 FEATURES:
- 150kHz to 30MHz continuous coverage, AM, SSB, or CW.
- 30 bands, each 1MHz wide, for easier tuning.
- Five digit frequency display, with 1kHz resolution.
- 6kHz IF filter for AM (wide), and 2·7kHz filters for SSB, CW and AM (narrow).
- Up-conversion PLL circuit, for improved sensitivity, selectivity and stability.
- Communications type noise blanker eliminates "pulse-type" noise.
- RF Attenuator allows 20dB attenuation of strong signals.
- Tone control.
- Front mounted speaker.
- "S" meter, with 1 to 5 SIMPO scale, plus standard scale.
- Coaxial, and wire antenna terminals for 2MHz to 30MHz. Wire terminals for 150kHz to 2MHz.
- 100, 120, 220, and 240VAC, 50/60Hz. Selector switch on rear panel.
- 13·8V DC operation.
- Other features include carrying handle, headphone jack, and record jack.

R 600

R600 RECEIVER. £235.06 inc VAT carriage £5.00

The TR-2500 is a compact 2 metre FM handheld transceiver featuring an LCD readout, 10 channel memory, lithium battery memory back-up, memory scan, programmable automatic band-scan and Hi/Lo power switch.

TR-2500 FEATURES:
- Extremely compact size and light weight 66 (2·5/8) W × 168 (6·5/8) H × 40 (1·5/8) D, mm (inches), 540g, (1·2lbs) with Ni-Cd pack.
- LCD digital frequency readout, with memory channel and function indication.
- Ten channel memory, includes "M0" memory for non-standard split frequencies.
- Lithium battery memory back-up, built-in, (estimated 5 year life) saves memory when Ni-Cd pack discharged.
- Memory scan, stops on busy channels, skips channels in which no data is stored.
- UP/DOWN manual scan in 5kHz steps.
- 2·5W or 300mW RF output. (HI/LOW power switch.)
- Programmable automatic band scan allows upper and lower frequency limits and scan steps of 5kHz and larger (5, 10, 15, 20, 25, 30kHz . . . etc) to be programmed.
- Slide-lock battery pack.
- Repeater reverse operation.
- Keyboard frequency selection across full range.
- Frequency coverage, 144·000 to 145·995MHz
- Optional power source, MS-1 mobile or ST-2 AC charger/power supply allows operation while charging. (Automatic drop-in connections.)
- High impact plastic case.
- Battery status indicator.
- Two lock switches for keyboard and transmit.

STANDARD ACCESSORIES:
- Flexible rubberized antenna with BNC connector.
- 400mAH heavy-duty Ni-Cd battery pack.
- AC charger.

TR 2500

TR2500 HANDHELD TRANSCEIVER £207.00 inc VAT carriage £5.00

APPROVED TRIO DEALER

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362-364 Soho Rd.
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0532 452657

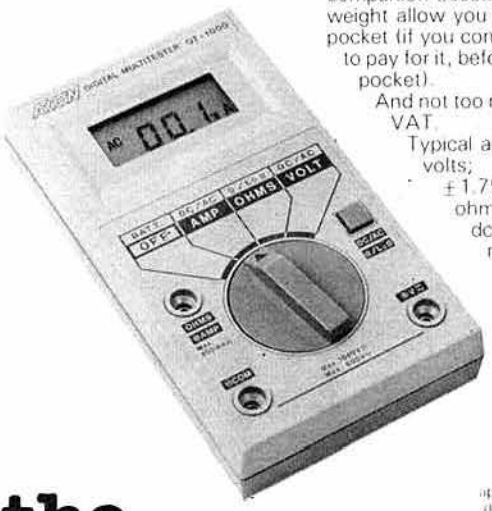
NORTHERN IRELAND
George Moore Electronics
7 Ravenhill Park Gardens
Belfast BT6 0DH
Belfast 647570

TRIO

As the appointed distributors for Trio, we recommend that you purchase your Trio equipment from an approved stockist (list above). Any stockist *not* on the list has no connection with the Trio UK sales and service organisation and cannot, despite claims to the contrary, offer any meaningful guarantee of backup service on Trio equipment.

the HONOR family

ANNOUNCE THE ARRIVAL OF THE GT1000 DIGITAL MULTIMETER



The GT1000 is the newest multimeter in the established range from Honor. Different because its digital LCD display gives instant unambiguous readings over its wide range (200mV full scale up to 1000 V full scale DC, 2 V-600 V AC). The meter is auto ranging and auto polarity selecting so you can pay attention to the measurement in hand without bothering with switch twiddling. Its even auto ranging on the ohms scales, and will measure from 200 ohms full scale up to 2M ohm. Amazing.

The GT1000 is designed to be your constant companion because its small size and light weight allow you to slip it into your jacket pocket (if you come to see it, we'd like you to pay for it, before testing it in your jacket pocket).

And not too much to pay at **£39.50** inc. VAT.

Typical accuracy is ±0.8% on dc volts;

±1.7% on ac volts; ± 1.2% on ohms and much the same on dc current and ac current ranges.

How can you resist it?

the MX 4

4 METRE PORTABLE SSB TRANSCEIVER

SSB and CW from 70.150 to 70.250 MHz with 200 mW power output.

Internal telescopic aerial. CW key and Nicad charger. Operates from either an internal battery or an ext 9 volt DC supply. (Optional module for 12 volts) the rig is supplied in semi-kit form for around **£75.00.**

the NRD, NSD line

If I am absolutely honest, I am not certain whether I own an NRD515 because of its unbelievable performance as a general coverage receiver or just for the sheer pleasure of having and constantly admiring probably the finest piece of equipment available today.

Perhaps it comes down to the same thing, certainly the other NRD owners I have spoken to have all expressed the same feelings, that the NRD is a receiver in a class of its own.

As a person not owning the receiver, you may ask what sets this particular one above all others. This is difficult to define – the feel of the equipment when wandering over the crowded band, its signal handling capability and selectivity can only really be appreciated by use. Technically, the equipment is above reproach. JRC's manufacture and production control methods as applied to other items in the range are equally applied to their amateur products. The other items I refer to, only a small part of the vast range, are marine radio equipment, Marisat mobile terminals, Omega navigators, doppler sonar, echo sounder/fish finders, communication satellite earth stations and a complete range of avionic beacons, radar and associated products. Indeed, a wide range application of electronic and radio technology for land, sea and air.

You may be forgiven for associating such advanced technology with complexity of operation, a piece of equipment that needs an operator with an electronics degree. However, the assumption is incorrect. The NRD is easy to use with the minimum of controls to ensure the operator really enjoys his listening time. Digital readout, MHz, mode and filter bandwidth switches together with a VFO knob that will tune the band continuously without using any other control, from 10 KHz to 30 MHz or vice versa. To assist with difficult band conditions the NRD515 has pass band tuning and the medium wave broadcast section from 600 KHz to 1.6 MHz has a preselector control to cope with the crowded conditions. Add the optional 600 Hz CW filter and the 96 channel memory unit and, as other NRD515 owners would say, "a joy to own".

Now available for the radio amateur who is also a short wave man is the NSD515 transmitter. Again, part of my station, the NSD515 is, without a doubt, the only companion for the NRD515. A connecting harness which links the two units together provides full transceive operation or on release of a push button the units assume their own identities and become separates. A "remote" position on the transmitter MHz switch enables the receiver MHz switch to control the transmitter, so, as you tune across the band and into an amateur section then the transmitter automatically "comes up" on the same band. With the remote VFO push button selected on the transmitter and the MHz switch at remote, the transmitter becomes the slave of the receiver and operating simplicity is yours. Of course, in only seconds the two pieces of equipment can be set to work cross band or duplex.

Add to the above an RF speech compressor, an overmodulation indicator and the ability to monitor your transmitted audio and you will see how easy it is to produce the perfect signal.

Add 100 watts of transmitted signal and an optional internal aerial tuning unit which is matched individually to each band and is switched from one band to the other remotely by either transmitter, receiver or memory unit and you will see how much care and attention to detail JRC apply to their range of amateur equipment.

POWER SUPPLY UNIT
NBD 515.
£148.35 inc. VAT

TRANSMITTER
NSD 515.
£1223.60 inc. VAT

RECEIVER
WITH 96 CHANNEL MEMORY UNIT
NRD 515 **NDH 515**
£1090.20 **£198 inc VAT**

SPEAKER
NVA 515
£34.50 inc. VAT

LOWE ELECTRONICS | Access | BARCLAYCARD VISA | LOWE ELECTRONICS | Access | BARCLAYCARD VISA

EMPORIUM NEWS

Good morning.

To all the people who read with interest about **Bill G3JYP and his NRD line up,** I must now explain that it was in fact a hoax. I am reliably informed that Bill is still more than **delighted with his TS830S.** My thanks to those who rang to compliment him on **his good taste** and also to the many insurance companies that have also rung with quotes for "full and comprehensive cover" on the new equipment.

For the four metre band now available is a hand held 4 metre **SSB and CW transceiver** covering 70·150 to 70·250MHz. Supplied complete with telescopic aerial, the rig is fitted with an **internal CW key** and provision is also made for an external CW key to be plugged in. External aerial and headphone sockets are also provided, the rig being supplied in semi kit form **for around £75.** The **Mizuho MX4,** like the popular Shimizu rig, **brings back the flavour of homebrew** equipment whilst still providing an attractive, usable and marketable transceiver. The evaluation rig accompanied me north to my good friend Bill G3JYP (yes, he's still talking to me), a true 4 metre man and we tried it on the air over Easter from the considerable heights of the Pennine chain. We used an external aerial, of course, **but a good time was had by all and quite a few stations were worked.** To my mind, the great attraction of this transceiver is the distance that can be worked with low power. Anyway, that's the rig – before I move on power output is around 200mW.

By the time you read this some will have seen **the new Trio HF rig with general coverage receive capability: the Trio TS930S.** A piece of equipment well worth waiting for. As we have said before, Trio may not be the first with a new piece of technology but they always seem to get it right the first time. You may have noticed that the Trio range of HF and, indeed, VHF equipment is **stable.** Not for them the addition letters and mark numbers of **continually revised** equipment. Trio's policy is to spend more time and effort developing the equipment before production so giving a longer period between model revisions and hence a more stable resale value.

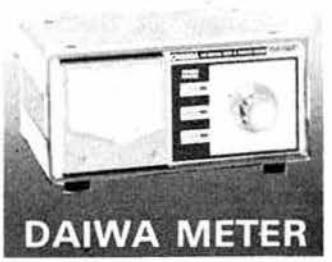
Of course one of the disadvantages is that Trio are not always first with a particular model but, as I have said in the advertisements, they are certainly **well worth waiting for!!** and that brings me to another thought: the Trio man. From what I have previously said, he cannot be the impatient sort or he would have purchased some other manufacturer's rig and since he is waiting for a model which will, undoubtedly, be a **cut above the rest,** he is discerning. Remember the TS520, S and SE – a piece of equipment revised only **three times** during a period of some **seven and a half years** and even then only being slightly amended at the request of amateurs. Indeed, we were very disappointed when such a reliable and popular rig was finally discontinued.

The new TS530S and TS830S transceivers are following on the same great tradition of reliability, operability and **outstanding value for money.**

In line with the above Trio policy, we are pleased to announce **the TR9130** – a 2 metre multimode based on the TR9000. Having a power output of **25 watts,** together with the additional features of squelch on single sideband, an additional memory channel and the new **green digital frequency display,** as I have said, not a new model for the sake of it but improvements in **specific areas requested by the amateur.**

Those of you who are familiar with the Honor family of meters will be interested to know that there has been an addition to the family – the **GT1000 auto ranging digital multitester.** Priced at £39.50 – send a stamped addressed envelope for full details on this particular item.

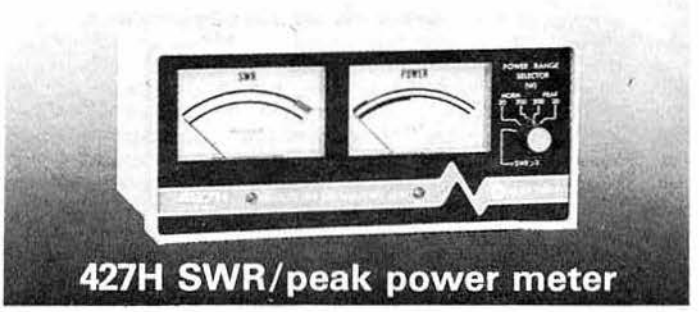
Still available and still proving popular is the **SR9 VHF monitor receiver.** At £46.00 this receiver is ideal for the newcomer to the hobby yet also provides additional monitoring facilities in the shack. You can, of course, use the VFO to find the required station but for greater convenience the particular crystal you need can be added and the SR9 is particularly suitable for monitoring the UOSAT **Oscar 9 satellite** and the now popular FM "slow morse" transmissions. To enable the SRX30D to widen its horizons, we should now have in stock the **optional FM board.** For those owning this receiver, and who require this option, telephone for more details.



Another **optional board** to enhance the popular **FX1 wavemeter** is now available. When fitted the optional board enables the FX1 to be used as a **dip meter.** Many of you have been enquiring about this item and we are pleased to now have it in stock. We apologize for the delay but again it is a piece of gear **well worth waiting for.**

Now in use in the showroom for testing and demonstration equipment is the new **Daiwa PS300 power supply.** A real piece of Daiwa perfection – 30 amps intermittent, 22 amp continuous with a cross needle pointer reading volts, amps and where the needles cross watts. Ask David to demonstrate what happens when the supply terminals are shorted together. Apart from the holes in his screw driver, **no damage to the unit at all** and power is instantly restored. Quite a show. However, we are going to have to stop him doing it as the ozone is making Traci frisky and none of us could stand that!

The **Daiwa PS300 is £117.99** and is only part of the range. Ring Traci for a full leaflet and price list.



Trio have introduced a new pair of headphones: the **HS6** – very lightweight and more ultra Hi Fi in style, they are certainly more **comfortable** than conventional cans. The HS6 headphones are £14.95 and the pair I have been trying are staying in my shack. In fact, they are so comfortable I have started wearing them around the house, not plugged into a rig, of course, but just to give me a moment's peace from the wife and budgerigar.

To keep the dust off your equipment, why not try our **rig covers,** carefully made by a new cottage industry. The covers are £3.50 large (suitable for, say, a TS830 or TS530) and £3.40 small (for a speaker or ATU).

Anyway, that's about it for now as I have just heard a rumour that Irene, our secretary, has just shown the workshop lads her **holiday photos** taken on some Greek beach and that they've all gone home for a cold shower, so until next time, Gud DXes 73es, FBYLS, XYLS, esFBOM, etc.

ICOM

TRIED, TESTED AND TRUSTED

See revue in February Rad.Comm.

IC-720A
Possibly the best choice in HF.
£883.inc.

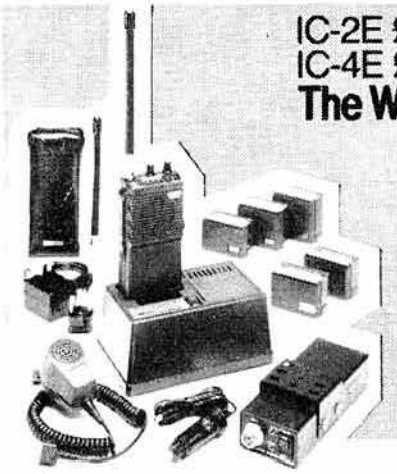
The main problem that the amateur of today has to deal with is deciding just which rig out of the many excellent products available he is going to choose. Technology is advancing at such a rapid rate and getting so sophisticated that many cannot hope to keep up. Some go too far!

Perhaps one way of dealing with the problem is to look at just what each model offers in its basic form without having to lay out even more hard earned cash on "extras". The IC-720A scores very highly when looked at in this light. How many of its competitors have two VFOs as standard or a memory which can be recalled, even when on a different band to the one in use, and result in instant retuning AND BANDCHANGING of the transceiver? How many include a really excellent general coverage receiver covering all the way from 100kHz to 30MHz (with provision to transmit there also if you have the correct licence)? How many need no tuning or loading whatsoever and take great care of your PA, should you have a rotten antenna, by cutting the power back to the safe level? How many have an automatic RIT which cancels itself when the main tuning dial is moved? How many will run full power out for long periods without getting hot enough to boil an egg? How many have band data output to automatically change bands on a solid state linear AND an automatic antenna tuner unit when you are able to add these to your station?

Well you will have to do quite a bit of hunting through the pages of this magazine to find anything to approach the IC-720A. It may be just a little more expensive than some of the others – but when you remember just how good it is, and of course the excellent reputation for keeping their secondhand value you will see why your choice will have to be an IC-720A!

IC-PS15 Mains PSU £99

IC-2E £159.inc.
IC-4E £199.inc.
The World's most popular portables



Nearly everybody has an IC2E – the most popular amateur transceiver in the world – now there is the 70 cm version which is every bit as good and takes the same accessories. Check the features.

Fully synthesized – Covering 144 – 145.995 in 400 5KHz steps. (430-439.999 4E)
Power output – 1.5W with the 9v. rechargeable battery pack as supplied – but lower or higher output available with the optional 6v or 12v packs. Rapid slide-on changing facility.
BNC antenna output socket – 50 ohms for connecting to another antenna or use the Rubber Duck supplied (flexible ¼ λ whip – 4E)
Send/battery indicator – Lights during transmit but when battery power falls below 6v it does not light, indicating the need for a recharge.
Frequency selection – by thumbwheel switches, indicating the frequency. 5KHz switch – adds 5KHz to the indicated frequency.
Duplex simplex Switch – gives simplex or plus 600KHz or minus 600KHz transmit (1·6MHz and listen input on 4E)
Hi-Low switch – reduces power output from 1.5W to 150mW reducing battery drain.
External microphone jack – if you do not wish to use the built-in electret condenser mic an optional microphone speaker with PTT control can be used. Useful for pocket operation.
External speaker jack – for speaker or earphone. This little beauty is supplied ready to go complete with nicad battery pack, charger, rubber duck.

A full range of accessories in stock.		£ p			
ICML1	10W mobile booster for IC2E	49 00	BC25	Mains charger as supplied	4 25
BP5	11 volt battery pack	30 00	DC1	12 volt adapter pack	8 40
BP4	Empty battery case for 6 x AA cells	5 80	HM9	Speaker microphone	12 00
BP3	Standard battery pack	17 70	CP1	Mobile charging lead	3 20
BP2	6 volt pack	22 00	IC123	cases	each 3 60
BC30	Base charger for above	39 00	All prices include VAT		

The IC4E is going to revolutionise 70 CM!

ICOM

ASK ABOUT THE NEW RANGE OF CUE DEE ANTENNAS....the winners in recent tests!

Amazingly small, yet very sensitive. Two VFO's, five memories, priority channel, full duplex and reverse. LED S-meter, 25KHz or 5KHz step tuning. Same multi-scanning functions as the 290 from mic or front panel. All in all the best 2M FM mobile ICOM have ever made.

IOW RF ouput on SSB, CW and FM. Standard and non-standard repeater shifts. 5 memories and priority channel.

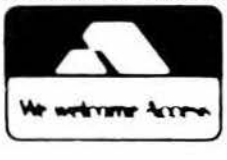
Memory scan and band scan, controlled at front panel or microphone. Two VFO's LED S-meter 25KHz and 1KHz on FM – 1KHz and 100Hz tuning steps on SSB. Instant listen input for repeaters.

ICOM produce a perfect trio in the VHF base station range, ranging from 6 Meters through 2 Meters to 70 cms. Unfortunately you are not able to benefit from the 6m product in this country, but you CAN own the IC-251E for your 2 Meter station and the 451E for 70 cms.

Both are really well designed and engineered multi-mode transceivers capable of being operated from either the mains or a 12 volt supply. Both contain such exciting features as scan facilities, automatic selection of the correct repeater shift for the band concerned, full normal and reverse repeater operation, tuning rate selection according to the mode in use. VOX on SSB continuous power adjustment capability on FM and 3 memory channels. Of course they are both fitted with a crystal controlled tone burst and have twin VFO's as have most of ICOM's fully synthesized transceivers. There is now a superb low noise mast head pre-amp available for the IC-451.

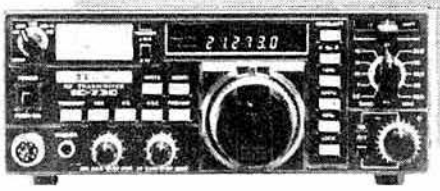
The famous IC-240 has been improved, given a face lift and renamed the IC-24G. Many thousands of 240's are in use, and its popularity is due in part to simplicity of operation, high receiver sensitivity and superb audio on TX and RX. The new IC-24G has these and other features. Full 80 channels (at 25kHz spacing) are available and readout is by channel number – selected by easy to operate press button thumbwheel switches. This readout can clearly be seen in the brightest of sunlight. Duplex and reverse duplex is provided along with a 12½ KHz upshift, should the new channel spacing be necessary. The old IC-240 proved to be the most reliable rig we have ever sold – the IC-24G because it is so similar, looks like following the same pattern. Remember for mobile use a rig MUST be easy to operate to be safe. Send for technical details.

Thanet Electronics



THE AMATEUR'S PROFESSIONAL FRIEND

IC-730 The best for mobile or economy base station £586.inc.



ICOM's answer to your HF mobile problems – the IC-730. This new 80m-10m, 8 band transceiver offers 100W output on SSB, AM and CW. Outstanding receiver performance is achieved by an up-conversion system using a high IF of 39MHz offering excellent image and IF interference rejection, high sensitivity and above all, wide dynamic range. Built in Pass Band Shift allows you to continuously adjust the centre frequency of the IF pass band virtually eliminating close channel interference. Dual VFO's with 10Hz and 1KHz steps allows effortless tuning and what's more a memory is provided for one channel per band. Further convenience circuits and provided such as Noise Blanker, Vox, CW Monitor, APC and SWR Detector to name a few. A built in Speech Processor boosts talk power on transmit and a switchable RF Pre-Amp is a boon on today's crowded bands. Full metering, WWV reception and connections for transverter and linear control almost completes the IC-730's impressive facilities.

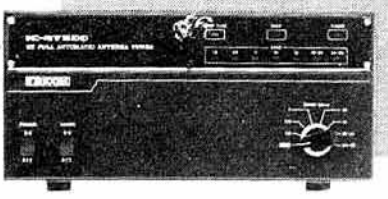
Super Linear IC-2KL £839.inc. Matching Power Supply IC-2KLPS £211.inc.

To compliment the excellent IC-720A HF Transceiver, ICOM have produced the IC-2KL linear amplifier. It is of a similar size and matches the IC-720A perfectly. It produces 500W output on SSB, CW, AM and RTTY needing 80-100W of drive. As with the IC-720A it will operate from 1.6MHz to 30MHz continuously at full output power, but you still need an antenna that matches. It will follow the IC-720A automatically changing bands WITH NO TUNING – the operating is done from the prime-mover.

This automatic facility can be overriden for use on rigs other than the IC-720A, but can be added to the IC-701 and the IC-730. The IC-2KL employs a heat pipe cooling system for the heatsink of the power transistors. This is a new technology used to transfer the heat, and has a high conductance, several hundred times that of copper, plus a very quick response.

The IC-2KL has a matching power supply the IC-2KLPS delivering 40vDC at 25A continuous for 10 minutes maximum.

IC-AT500 £299.inc. Automatic antenna tuner 100W version AT100 £249. inc.



The Automatic Antenna Tuners which put all the others to shame.

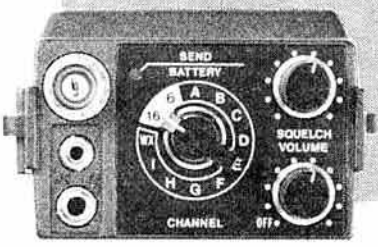
It was only when we started to use the new fully automatic antenna tuners from ICOM that we realised just how far ahead of their competitors they are! The very fast tune up time and simplicity of use make them a real worthwhile addition to any station even if the rest of your station isn't ICOM. If it is, then you have the added advantage of fully automatic band selection so that you can virtually hide it away in a cupboard if you want (though we think you will want to show it off).

Apart from its very rapid action and auto band selection facilities it will select the correct antenna for the band (up to four). The new bands are covered of course, but the AT100 does not cover topband, whereas the AT500 does.

Dual accessory sockets are supplied so that you can easily chain your IC-720A, (or IC-701 or IC-730) together with the IC-2KL and AT5 to produce what must be one of the most advanced automatic stations available.

Why not call us for more details or get your dealer to demonstrate one to you today?

A marine version of the IC-2E £199.+VAT.



12 Channels – Synthesised – No Crystals to buy!

ICOM are proud to introduce the IC-M12 which is the Marine version of the worlds most popular portable, the IC-2E. It uses all the same accessories, has the same exceptional receiver sensitivity and versatility of the 2E and it is HOME OFFICE APPROVED.

It is almost certain to prove the most popular Marine hand portable in the world. So if you are not in marine yourself why not tell your friends about it!

12 programmable channels which include the private ones.
£199 + VAT.

Trade Enquiries Welcome

Free carriage on direct sales – call us.

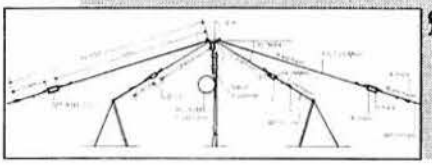
See us at ELVASTON CASTLE RALLY JUNE 13th

Tono RTTY and CW computers
7000E-£550./9000E-£650.inc.

The TONO range of communication computers take a lot of beating when it comes to trying to read RTTY and CW in the noise. Others don't always quite make it!

Check the many facilities offered before you buy – especially look at the 9000E which also throws in a Word Processor. Previous ads have told you quite a lot about these products – but why not call us for further information and a brochure?

A new Trap Dipole!
£49.50.inc.



The MT-240X Multi-band trap dipole antenna (80m – 10m) is a superbly constructed antenna with its own Balun incorporated in the centre insulator with an SO239 connector. Separate elements of multi-stranded heavy duty copper wire are used for 80-40-15 and 20-10 Metres.

Really one up on its competitors. £49.50 inc. VAT

NEW! £699.inc.
with built-in VDU

Following the success of the Tono 7000E communications computer, we are now able to announce the arrival of a completely new machine on the market. The CWR 685 Telereader.

Brief features are – Transmits and receives (via a suitable transceiver) CW, RTTY and ASCII (optional) – Built in 5" green display monitor. It will handle the alphabet, numerals, symbols and special codes on CW.

Speeds – CW – 3 wpm to 50 wpm with automatic speed tracking RTTY and ASCII – 45·45,50,56·88,74·2,110 and 300 bauds. (300 bauds speed is possible when external modern or TTL input is used).

Input – AF input for CW, RTTY and ASCII from phone Jack (usable from 8 to 1000 ohms, 30 mV to 2V.

Display outputs – RF output and composite video output 1V P.P 75 ohms. 6 memories – 32 chrs each.
Printer interface – Centronic compatable parallel interface built-in.

Output for oscilloscope – RTTY and ASCII impedance 200K ohm 1V P.P

Number of characters display – 512 characters x 2 pages – total 1024

Power source – 13.8 V.D.C.
Complete with full size keyboard.

Receive only version CWR 600 – £189 inc.

Prices of other Tono quality products
These prices may be subject to change, depending upon the state of the £.
All inclusive of vat.
Green display monitor CRT1200G £136.00
Dot Matrix Printer HC900 £590.00
Dot Matrix Printer HC800 £499.00
Printer socket SK7 £8.50p
Linear amplifiers:
UC70 430 MHz 55W + RX pre-amp £149.00
2M-50W (2M) £65.00
2M-100W (2M) + RX pre-amp £115.00
MR-250W (2M) + RX pre-amp £259.00
MR-28LB
(26-30 MHz) + RX pre-amp £65.00
Mast-Head Pre-amp:-
RX144 £65.00 – RX430 £70.00
(both include control and psu box)

You will get a good deal from Thanet – Call us.
Why buy from Thanet?
1. Full 2 years warranty on all equipment
2. Excellent back up and after sales service using fully equipped work shop.
3. ICOM trained technical staff
4. No charge for speedy delivery service
5. Avoid disappointment – buy from the experts with years of experience.

Instant credit available in most cases.
1. Phone us during office hours
2. Out of hours leave a message on our ansaphone stating clearly your name, address, day time telephone number and Access/Barclaycard number.
3. Write enclosing full details of your requirements together with payment, quoting call sign if possible.

Please note: Access/Barclaycard owners – goods must be sent to address registered with credit card company.

Thanet Electronics

143 Reculver Road, Beltinge, Herne Bay, Kent. Telephone (02273) 63859.

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Wales – Tony GW3 FKO 0874 2772 or
0874 3992
North West – Gordon G3LEQ Knutsford (0565) 4040 ansaphone available

ICOM

All prices inclusive of VAT.

Remember we also stock Yaesu, Jaybeam, Datong, Welz, G-Whip, Western, TAL, Bearcat, RSGB Publications.

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

IF PRICES & QUALITY ARE IMPORTANT — — —

— — — READ ON!

EASY ORDER FORM ON PAGE 472

T1200 £179

- 142-148MHz FM
- 3 Watts or 1 Watt
- Programmable steps 5kHz-100kHz
- 10 memory channels
- Comprehensive scanning
- Ni-cad battery pack
- AC mains charger

Accessories: case and speaker mic

PALM II (mkII) £109

- 140MHz-150MHz FM
- 6 xtal controlled channels
- 600kHz repeater shift
- S20 and S22 fitted
- 1 Watt output
- Ni-cad battery pack
- AC mains charger

2M and 70cm — — — — — — — THE SENSIBLE APPROACH

70cms EXPANDER £199 2m M750E £289 PS750 AC PSU £66

With money getting tighter it's quite amazing that people will spend up to £800 in order to run all-modes on both 2m and 70cms Two separate all-mode rigs for 70cms and 2m may be a luxury but at a price. Not surprisingly more and more people are realising the true versatility in the M750E concept. Even the basic 2m all-mode M750E makes an £80 saving over the competition. Then for less than £200 you can enjoy all-modes on 70cms. That's half the price of any comparable all-mode rig. So forget the expensive options, get yourself an M750E set up and with the money you've saved, give the family a holiday—that's something that will meet with instant XYL approval!

GUARANTEED SAME DAY DESPATCH !

ON ALL IN STOCK ITEMS BARCLAYCARD & ACCESS TELEPHONE ORDERS WELCOMED

MONEY SAVERS

1kW 5-BAND DIPOLE with feeder

At last a 5-band dipole. Our unit is complete with 1kW traps, 14swg alloy wire, centre and end insulators, 50ft of UR43 with PL259, nylon rope and sundry wire clamps etc. Limited stocks at this price. These really are first class units that are beautifully finished and fully corrosive resistant.

80-10m
118ft long
£39
p&p £2

Ideal for use with WELZ AC38 ATU

NEW ADONIS MICS

Two new Adonis microphones for the modern generation of equipment. Both have high quality condensor inserts, feature up/down buttons for remote frequency control and have switchable response for FM/SSB. The 503 model also features a dual level compressor.

AM 303 £27.00 AM 503 £35.00

ADONIS HEADSET WITH MIC

At last, a quality headset and boom mic. purpose made by Adonis for Amateur Radio. Included is a Tx/Rx control box ideal for mobile operation with up/down frequency control buttons. Can equally be used for base stations and matches all current sets.

MM 202HM £39.00

CW ENTHUSIASTS—HOW'S THIS FOR VALUE? £31.95

Model EK121

Yes, it's true, this little unit has all the features you would expect from something costing a lot more. Built in paddle, dot memory for easy sending, semi- or fully automatic switch settings, variable speed control. LED indicators, etc. It matches all modern transceivers and comes complete with instructions and can be either self powered from HP7 cells or external DC supply.

COMPLETE MORSE TRAINING KIT

Following our successful offer last year, we've put together another little morse training kit. It comprises professional quality morse key, morse oscillator and RSGB morse code handbook. Send for yours today - it's a sound investment.

£19.95

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

Dear Customer,

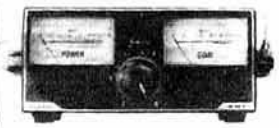
Many of you will have just received your new licences to which I extend my congratulations. At Hockley we have one of the widest selections of amateur radio equipment available. Product names include Trio, Yaesu, FDK, Icom, Welz etc, all with factory warranties and, of course, our own customer service department. As well as a large retail showroom, we also have an excellent mail order service so why not get in *touch*—*we* can offer a great deal!

Peter Waters

TRIO—FULL RANGE STOCKED

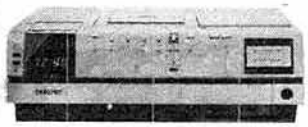
TS830S	160 10m transceiver 9 bands	£694.00 (5.00)
VFO230	Digital VFO with memories	215.00 (5.00)
AT230	All-band ATU power meter	119.00 (2.25)
SP230	External speaker unit	34.95 (1.50)
DS2	Optional dc pack for TS830S	43.95 (1.50)
DFC230	Dig fequency remote controller	179.00 (1.50)
YK88C	500Hz CW filter	29.60 (1.00)
YK88CN	270Hz CW filter	32.60 (1.00)
TS530SE	160 10m trans 200w pep digital	534.00 (5.00)
VFO240	External VFO	92.50 (5.00)
SM220	Station monitor scope	198.00 (5.00)
BS8	Pan display TS820/180/830	44.85 (.50)
BS5	As above for TS520	44.85 (.50)
R820	Amateur band receiver	589 (5.00)
YG455C	500Hz CW filter	61.00 (.50)
YG455CN	250Hz CW filter	65.00 (.50)
YG88A	6kHz AM filter	35.40 (.50)
TS180S	160 10m S/State transceiver	679.65 (5.00)
VFO180	External VFO	96.60 (1.50)
SP180	External speaker unit	36.80 (1.50)
AT180	Matching 200W antenna tuner	95.45 (5.00)
YK88C	500Hz CW filter	29.60 (.50)
YK88S	Second SSB filter option	29.20 (.50)
PS30	AC power supply for TS180S	88.50 (5.00)
TS130S	8 band 200W pep	525.00 (5.00)
TS130V	8 band 20W pep	445.00 (5.00)
DFC230	Dig frequency remote controller	179.00 (1.50)
TL120	200W pep linear for TS120v	144.00 (5.00)
MB100	Mobile mount for TS120/130	17.00 (1.00)
YK88C	500Hz CW filter	29.60 (.50)
YK88S	2nd SSB filter option	32.60 (.50)
VFO120	External VFO	85.00 (5.00)
SP120	Base station external speaker	23.00 (1.25)
SP40	New mobile speaker unit	12.40 (1.50)
AT130	100W antenna tuner	79.00 (1.50)
PS20	AC power supply TS120/130V	49.45 (5.00)
PS30	AC power supply TS120/130S	88.50 (5.00)
MA5	5 band mobile aerial system	88.75 (4.50)
TL922	160 10 metre 2KW linear	624.00 (5.00)
MC50	dual impedance desk microphone	25.75 (1.50)
MC35S	Fist microphone 50K impedance	13.80 (1.00)
MC30S	Fist microphone 500ohm imp.	13.80 (1.00)
LF30A	HF lowpass filter. 1kW	19.30 (1.00)
RD300	1kW oil filled dummy load	52.00 (1.50)
TS770E	2m/70cm all mode transceiver	785.00 (5.00)
SP70	External speaker unit	18.60 (1.00)
TR9000	2m synthesised multimode	359.00 (5.00)
TR9500	70cm all-mode	449.00 (5.00)
BO9	Base plinth for TR9000	34.95 (5.00)
TR7800	2m FM synthesised mobile	284.00 (5.00)
TR7850	40w version of above	314.00 (2.50)
TR8400	70cm FM synthesized	334.00 (2.50)
PS10	AC psu for above	64.75 (2.50)
TR2300	2M FM synthesised portable	166.75 (5.00)
VB2300	10W amplifier for TR2300	58.00 (1.50)
MB2	Mobile mount TR2300/VB2300	17.70 (1.00)
RA1	Rubber flexible antenna	6.90 (.50)
PS1200	AC power unit and charger	29.50 (1.50)
TR2400	2m FM synthesised handheld	198.95 (5.00)
SMC24	External speaker/mic	13.80 (1.00)
ST1	Base stand and quick charger	45.00 (1.50)
BC5	12V quick charger	18.40 (1.50)
SC3	Soft carrying case.	11.50 (.50)
LH1	Hard leather holster	20.00 (.50)
PB24	Spare battery pack/charger lead	15.00 (1.50)
PL1	Spare power/charge lead	1.50 (.15)
R1000	Gen. Coverage Receiver	295 (5.00)
SP100	External speaker	26.90 (2.50)
HC10	Digital desk World Clock	58.75 (1.50)
HS5	Deluxe Comm. headphones	21.85 (1.00)
HS4	Standard headphones	10.35 (1.00)
DM801	Dip meter	60.00 (1.75)
TR7730	New 25W FM transceiver	247.00 (5.00)
TR9130	New 25W 2M All-mode	395.00 (5.00)

VW3 SWR/PWR/FS METER 3-150MHz—RECOMMENDED



£11.95 + 60p p&p

VIDEO! SONY BETAMAX C5 £429 (£8 carriage)



SUPERB PICTURE QUALITY

The Sony C5 is acknowledged by those who know as the best video recorder on the market for **under £500.** Crisp, clear colour pictures combined with picture search and freeze frame make it an ideal machine for home and amateur TV use. The built in timer can be programmed up to 7 days in advance and, of course, all units come with Sony UK's own guarantee.

SONY COLOUR CAMERA £599 (£8 carriage)

What better companion to the C5 than Sony's colour camera the HVC3000P. Fitted with an f1·4 lens the camera has excellent low light performance operating at light levels of 35 lux and this giving excellent performance without the need for special lighting.

FDK THE NUMBER ONE FM RIG

M700EX 25 WATTS £199

Every so often a classic is born that outlasts and outperforms the competition. In FM radio the M700EX is just such a rig. Its the simplicity of design combined with rugged and total reliability plus a power output in excess of 25 watts that make it a rig of technical excellence. Then consider that it costs under £200, has scanning, and you'll start to see how it so quickly became Britain's number one selling FM rig. Send for colour leaflet today and learn more about the M700EX classic design.

WELZ—IS THERE REALLY ANY OTHER CHOICE?

SP-45M SWR/PWR METER

The SP-45M has been designed for the VHF/UHF enthusiast who requires the means of accurately measuring true rf power and swr. The completely flat response means instant measurement from 140-470MHz. Full scale ranges of 3, 20 and 100 watts cater for most requirements.

CH-20N COAX SWITCH—Rated to 1·3GHz!

Here's a switch that is a must for UHF. Fitted "N" sockets it has an insertion loss of less than 0·1dB up to 1,300MHz and cross talk better than 50dB. There is certainly nothing else on the market that can touch this performance at this price!

Max power 1kW
Freq range 1·8MHz-160MHz

THE SUPERB SP200 EVERY SHACK SHOULD HAVE ONE!

£59 inc VAT

The SP200 is a highly reliable and accurate RF power and in-line SWR meter. It's specially designed sensing head has a flat response from 1·8MHz to 160MHz requiring no calibration. Simply connect it in the aerial line and whether you are on 160 metres or 2 metres, it will read true RF power. Also incorporated is a 2-way aerial switch and a 3-range power selector covering 20 watts, 200 watts and 1kW.

USE YOUR HEAD!

AZDEN PCS 3000

THE RIG WITH THE DETACHABLE CONTROL HEAD

£219

FREE CREDIT!

The electronics versatility combined with mechanical forethought of design has made the PCS300 a remarkable package at an incredible price. Its eight channel memory combined with 3 modes of scanning add up to a most practical design. Then consider its 25 watts plus of output power and its detachable control head feature and you'll see how easily it beats the opposition. Then there is those little extras; whilst competitors offer up/down frequency control from the microphone, the PCS3000 has added to this a remote volume control and reverse repeater button all in the palm of your hand. Don't delay, send today for full colour brochure.

AZDEN PCS 300 ONLY £179

We've really broken the price barrier with this brand new unit from Azden combining all the features you've ever wanted in a hand-held at an incredible inclusive price. Incredibly powerful, it will give over 3 watts output in the high power mode with ½ watt in the low power position. Coverage is 144 to 146MHz in 12½kHz steps, ideal for UK use. Tone burst and 600kHz repeater shifts are all included for any repeater in Europe. The clear LCD display is a mine of information, indicating frequency, memory address, repeater shift, bar "S meter" reading. RF output and low battery volts. The front panel key pad is of superior construction with a piezo bleeper indicating key entry on every function.
Comprehensive scanning facilities include band scanning and memory scanning plus programmable upper and lower band limits, with pause and auto resume. Unlike most rigs the memory back-up is permanently connected as it draws a miserly 0·01ma! Other controls include programmable repeater shift, dial illumination, key lock, PTT lock, etc.

NOW ICOM! HF & VHF

FULL RANGE IN STOCK — — —
— — — WITH FACTORY BACK-UP

Now you can buy Icom radio products from your favourite shop where amateur radio, good service and competitive prices all come together. All stock is supplied by the factory authorised distributor and, therefore, has full guarantee and back-up. Take your choice from the entire range and send sae for full colour leaflets.

IC730	HF Mobile TRx 80-10m 100W 12V	**£585 (n/c)**	**IC490E**	70cm FM/SSB/CW Mob. TRx 10W 12V DC	**£445 (n/c)**
IC720A	HF TRx + Gen Cov Rx 100W 12V	**£880 (n/c)**	**IC25E**	2m FM Mob. tran 25W 12V DC	**£259 (n/c)**
PS15	Matching psu for both above 230V AC	**£99 (n/c)**	**IC2E**	2m FM hand-held TRx 144-146MHz	**£159 (n/c)**
IC251E	2m FM/SSB/CW TRx 230V/12V	**£495 (n/c)**	**IC4E**	70cm FM hand-held TRx	**£199 (n/c)**
IC290E	2m FM/SSB/CW Mob. TRx 10W 12V DC	**£365 (n/c)**	**LC1/3**	Cases for above	**£3.50 (75p)**

YAESU — FULL RANGE STOCKED

FT101ZFM	160-10m 9 band transceiver	**590.00** (5.00)
FT101ZDFM	160-10m 9 band transceiver	**645** (5.00)
DIGT 1Q1Z	Digital unit for	**90.00** (1.00)
DCT101Z	DC adaptor	**42.50** (1.00)
FV101Z	Remote vfo	**112.00** (5.00)
FANT101	Fab for 101 series	**13.80** (1.00)
FT902DM	9 band AM/FM transceiver	**885.00** (5.00)
FT902DE	9 band transceiver	**790.00** (5.00)
FC902	9 band atu, swr/pwr etc	**135.00** (5.00)
FTV901R	Transverter fitted 2m module	**285.00** (5.00)
430TV	70cm module for above	**185.00** (5.00)
144TV	2m module for transverter	**100.00** (1.75)
70TV	4m module for transverter	**80.00** (1.75)
YO901P	Monitor scope with pan, adap.	**330.00** (5.00)
YO901	Standard monitor scope	**256.00** (5.00)
FV901DM	Remote vfo for 901	**260.00** (5.00)
SP901	External speaker	**31.00** (2.00)
FL2100Z	9 band 1200W linear	**425.00** (5.00)
FT107	9 band solid state 100W	**725.00** (5.00)
FT107DMS	As above but with memory	**799.00** (5.00)
DMST107	Memory unit	**92.75** (2.00)
FV107G	Remote vfo for above	**98.50** (5.00)
SP107G	External speaker	**29.90** (2.00)
FC107G	Aerial tuning unit	**112.70** (5.00)
FP107	230V AC power module	**101.95** (2.50)
FP107EG	As above in cabinet	**113.00** (5.00)
FT707	8 band solid state 100W	**549.00** (5.00)
FP707	230V AC power supply	**125.00** (5.00)
FC707	Aerial tuner (unbalanced only)	**85.00** (2.00)
MR7	Metal rack for above	**15.70** (2.00)
MMB2	Mobile mounting bracket	**16.00** (1.00)
FRG7	0·5-30MHz receiver	**199.00** (n.c.)
FRG7700	SSB/AM/FM recvr. dig. readout	**329.00** (n.c.)
MEM7700	Memory unit for above	**90.00** (1.00)
Converters for above:		
FRV770A	118-150MHz in stock	**69.75** (1.75)
FRV7700B	50-60MHz & 118-150MHz	**75.50** (1.75)
FRV7700C	140-170MHz	**65.95**
FRV7700D	70-80MHz & 118-150MHz	**72.45** (1.75)
FRT7700	Receiver aerial tuner	**37.85** (2.00)
FF5	LF filter for above	**9.95** (1.00)
FT480R	2m all-mode transceiver	**365.00** (2.00)
FP80A	230V AC power supply	**63.25** (2.00)
FL2050	50 watt linear	**126.50** (2.00)
FT780R	70cm all-mode transceiver	**449** (2.00)
FT290R	2m all mode portable	**249.00** (2.00)
NC11C	AC charger	**8.00** (1.00)
CSC-1	Carrying case	**3.45** (.50)
MMB-11	Mobile mounting bracket	**22.25** (1.50)
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NC/WSE	2 amp hour ni-cad pack	**20.00** (1.75)
FT208	2m synthesized portable FM	**209.00** (n.c.)
NC9C	AC charger	**8.00** (1.00)
FT708R	70cm hand-held	**219.00** (n.c.)
FP4	230V/4amp psu	**42.95** (2.00)
FP12	230V/12 amp psu	**86.25** (2.50)
YP150Z	150W dummy load power meter	**92.00** (2.00)
YH55	Standard 8 ohm headphones	**9.95** (1.00)
YH77	Lightweight headphones	**10.00** (1.00)
QTR24D	World Ham clock	**28.00** (1.50)
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YM35	600 ohm hand mic. up/down 8 pin p.	**13.80** (1.00)
YM36	600 ohm as above (no up/down)	**13.00** (1.00)
YM37	600 ohm hand mic. 8 pin plug	**6.90** (1.00)
YE7A	600 ohm hand mic. 4 pin plug	**6.90** (1.00)
YD844A	600/50k ohm base mic. 4 pin plug	**25.30** (1.00)

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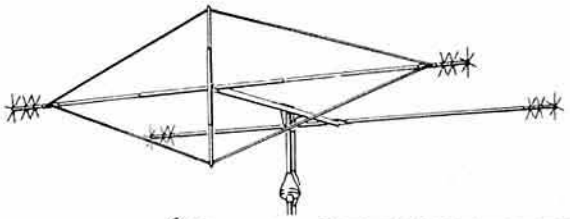

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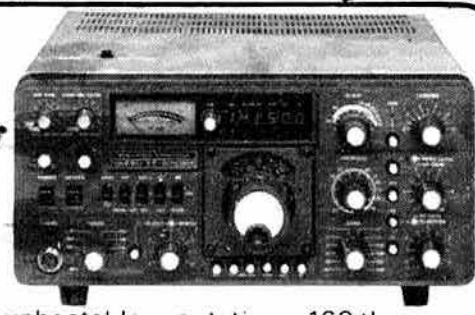
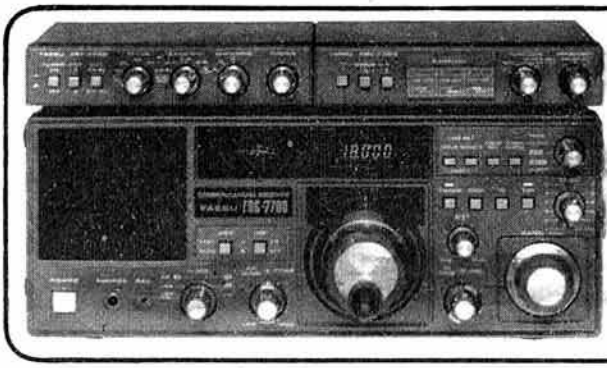
FT-902DM Competition grade HF transceiver



The YAESU world famous pace–setter with the acknowledged unbeatable reputation. 160 thru 10 metres including the new WARC bands. All–mode capability, SSB, CW, AM, FSK and FM transmit and receive. Teamed with the FTV–901R transverter coverage extends to 144 & 430MHz.

FT-707 All solid-state HF mobile transceiver

The definitive HF mobile rig, digital variable IF bandwidth, 100 watts PEP SSB, AM, CW (pictured here with 12 channel memory VFO). Latest bands



FRG-7700 High performance communications receiver

YAESU's top of the range receiver. All mode capability. USB, LSB, CW, AM *and* FM 12 memory channels with back up. Digital quartz clock feature with timer. Pictured here with matching FRT–7700 Antenna tuner and FRV–7700 VHF converter.

KEEP AHEAD WITH THE NEW FT-102!

Once again YAESU lead the field with the exciting new FT-102 HF transceiver – no other manufacturer offers so many innovative features.

Better Dynamic Range
The extra high-level receiver front end uses 24 VDC for both RF amplifier and mixer circuits, allowing an extremely wide dynamic range for solid copy of the weak signals even in the weekend crowds. For ultra clear quality on strong signals or noisy bands the high voltage JFET RF amplifier can be simply bypassed via a front panel switch, boosting dynamic range beyond 100dB. A PLL system using six narrow band VCOs provides exceptionally clean local signals on all bands for both transmit and receive.

Total IF Flexibility
An extremely versatile IF Shift/Width system, using friction-linked concentric controls and a totally unique circuit design, gives the operator an infinite choice of bandwidths between 2.7kHz and 500Hz, which can then be tuned across the signal to the portion that provides the best copy sans QRM, even in a crowded band. A wide variety of crystal filters for fixed IF bandwidths are also available as options for both parallel and cascaded configurations. But that's not all; the 455kHz third IF also allows an extremely effective IF notch tunable across the selected passband to remove interfering carriers, while an independent audio peak filter can also be activated for single-signal CW reception.

New Noise Blanker
The new noise blanker design in the FT-102 enables front panel control of the blanking pulse width, substantially increasing the number of types of noise interference that can be blanked, and vastly improving the utility of the noise blanker for all types of operation.

Commercial Quality Transmitter
The FT-102 represents significant strides in the advancement of amateur transmitter signal quality, introducing to amateur radio design concepts that have previously been restricted to top-of-the-line commercial transmitters; far above and beyond government standards in both freedom from distortion and purity of emissions.

Transmitter Audio Tailoring
The microphone amplifier circuit incorporates a tunable audio network which can be adjusted by the operator to tailor the transmitter response to his individual voice characteristics before the signal is applied to the superb internal RF speech processor.

IF Transmit Monitor
An extra product detector allows audio monitoring of the transmitter IF signal, which, along with the dual meters on the front panel, enables precise setting of the speech processor and transmit audio so that the operator knows exactly what signal is being put on the air in all modes. A new "peak hold" system is incorporated into the ALC metering circuit to further take the guesswork out of transmitter adjustment.

New Purity Standard
Three 6146B final tubes in a specifically configured circuit provide a freedom from IMD products and an overall purity of emission unattainable in two-tube and transistor designs, while a new DC fan motor gives whisper-quiet cooling as a standard feature. For the amateur who wants a truly professional quality signal, the answer is the Yaesu FT-102.

New VFO Design
Using a new IC module developed especially for Yaesu, the VFO in the FT-102 exhibits exceptional stability under all operating conditions.

ANCILLARY EQUIPMENT

SP-102 EXTERNAL SPEAKER/AUDIO FILTER
The SP-102 features a large high-fidelity speaker with selectable low- and high-cut audio filters allowing twelve possible response curves. Headphones may also be connected to the SP-102 to take advantage of the filtering feature, which allows audio tailoring for each bandwidth and mode of operation to obtain optimum readability under a variety of conditions.

FC-102 1.2 KW ANTENNA COUPLER

FV-102DM SYNTHESIZED, SCANNING EXTERNAL VFO

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2 Way Diecast (V.H.F.)		10.00	(0.50)
2 Way Toggle (V.H.F.)		5.00	(0.50)

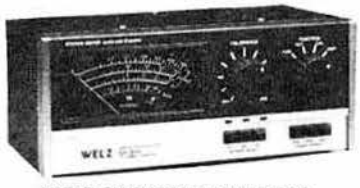
HELICAL ANTENNAS			
2M BNC or PL259 (state which required)		4.50	(0.50)
2M Thread for TR2300 or FT290R (state which)		4.50	(0.50)
70cm BNC or thread		4.50	(0.30)

YAESU			
FT1	Superb new HF Transceiver	1295.00	(—)
FT902DM	160-10m 9 Band Transceiver	885.00	(—)
FC902	All Band A.T.U.	135.00	(1.50)
SP901	External Speaker	31.00	(1.50)
FT101Z	160-10m 9 Band Transceiver (FM)	590.00	(—)
FT101ZD	160-10m 9 Band Transceiver (FM) Digital R.O.	665.00	(—)
DCT101Z	DC/DC Power Pack	42.55	(1.50)
FAN101Z	Cooling Fan for 101Z/ZD	13.80	(0.75)
FT707	8 Band Transceiver 200W Pep	569.00	(—)
FT707S	8 Band Transceiver 20W pep	485.00	(—)
FP707	Matching Power Supply	125.00	(5.00)
FTV707R (2)	Transverter - 2M	198.00	(—)
FV707DM	Digital V.F.O.	203.00	(—)
FC707	Matching A.T.U./Power Meter	85.00	(1.00)
MR7	Metal Rack for FT707	15.70	(1.00)
MMB2	Mobile Mounting Bracket for FT707	16.10	(1.00)
FRG7	General Coverage Receiver	199.00	(—)
FRG7700	200KHz-30MHz Gen. Coverage Receiver	329.00	(—)
FRG7700M	As above but with Memories	409.00	(—)
FRT7700	Antenna Tuning Unit	37.00	(1.00)
FT208R	2M FM Synthesised Handheld	209.00	(—)
FT290R	2M Portable Synthesised Multi-mode	249.00	(—)
FT708R	70cm FM Synthesised Handheld	219.00	(—)
NC7	Base Trickle Charger	26.88	(1.30)
NC8	Base Fast/Trickle Charger	44.10	(1.50)
NC9C	Compact Trickle Charger	8.00	(0.75)
FBA2	Battery Sleeve for use with NC7/8	3.05	(0.50)
FNB2	Spare Battery Pack	17.25	(0.75)
PA3	12V DC Adaptor	13.40	(0.75)
FT480R	2M Synthesised Multimode	379.00	(—)
FT780R	70cm Synthesised Multimode (1.6MHz Shift)	459.00	(—)
FP80	Matching 230V AC Power Supply	63.00	(1.50)

FT290R	2M Portable Synthesised Multimode	249.00	(—)
MMB11	Mobile Mounting Bracket	22.25	(1.00)
CSC1	Soft Carrying Case	3.45	(0.75)
NC11C	240V AC Trickle Charger	8.05	(0.75)
FL2010	Matching 10W Linear	64.00	(1.20)
Nicads	2.2 AMP HR Nicads. Each	2.50	(—)
FF501DX	H.F. Low Pass Filter 1kW	23.00	(1.00)
FSP1	Mobile External Speaker 8 ohm 6W	9.95	(0.75)
YH55	Headphones 8 ohm	10.00	(0.75)
YH77	Lightweight Headphones 8 ohm	10.00	(0.75)
QTR24D	World Clock (Quartz)	28.00	(0.75)
YM24A	Speaker/Mic 207/208/708	16.85	(0.75)
YD148	Stand Microphone Dual IMP 4 Pin Plug	21.00	(1.50)
YM34	As 148 but 8 Pin Plug	21.45	(1.50)
YM38	As 34 but up/down Scan Buttons	24.90	(1.50)

FDK VHF/UHF EQUIPMENT			
Multi 700EX	2M FM Synthesised 25W Mobile	199.00	(—)
Multi 750E	2M Multimode Mobile	289.00	(—)
Expander	70cm Transverter for M750E	199.00	(—)

STANDARD VHF/UHF			
C78	70cm FM Portable	219.00	(—)
CPB78	10W Matching Linear	67.50	(1.50)
C58	2M Multimode Portable	239.00	(—)
CPB58	25W Matching Linear	79.50	(1.50)
CM8	Mobile Bracket	19.95	(1.00)
CL8	Soft Carrying Case	6.95	(0.75)
C12/230	Charger	7.59	(0.75)



WELZ SWR/POWER METERS

SWR - POWER METERS			
Model 110	H.F./2M Calibrated Power Reading	11.50	(0.50)
SWR25	H.F./2M Twin Meter	11.50	(0.50)
UH74	2M/70	14.30	(0.50)
WELZ SP15M	H.F./2M 200W	29.00	(0.75)
WELZ SP45M	2M/70cm 100W	45.00	(0.75)
WELZ SP200	H.F./2M	59.00	(1.00)
WELZ SP300	H.F./2M/70	79.00	(1.00)
WELZ SP400	2M/70	59.00	(1.00)
DAIWA SW110A	H.F./2M	35.00	(—)
DAIWA CN620A	H.F./2M Cross Pointers	52.80	(—)
DAIWA CN630	2M/70 Cross Pointers	71.00	(—)

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Handcross is a small rural Sussex village with good pubs, a teashop, National Trust Gardens and of course—all with no parking problems or traffic congestion.
The location is just off the A23 London-Brighton road about 5 miles south of Gatwick Airport with motorway links to London and North Kent.

Bredhurst electronics

IN JAPAN THEY SAY THINGS DIFFERENTLY
but in any language the new FT102S will be a certain winner

外部スピーカー ¥9,800
SP-102
オーディオフィルター付き
オールモードHFトランシーバー
FT-102S
1.8–29.7MHz SSB/CW/(AM/FMオプション)

- 1.8MHz帯から28MHz帯までのアマチュアバンドを、SSB, CW, (AM/FMオプション)のオールモードでカバー
- IF帯域をずらし、狭くしたりするノッチ、オーディオピークフィルターで抜群の混信除去
- 本格的送信管6146Bを3本(100W機)使用、IMD特性が大幅に改善され、良質で余裕の出力を実現
- マイクアンプにトーンコントロールが付きモニター回路で音質を設定できしながら好みの送信音質を設定できるウッドペッカーノイズのような輪の広いパルス性ノイズにも効果のあるノイズブランカー装備
- RFスピーチプロセッサー、AGC切換えなど豊富な付加回路を内蔵
- 受信部のダイナミックレンジは100dBを達成

新発売

YAESU

Features include: superb dynamic range: versatile I.F. Shift/Width system: New noise blanker: commercial quality transmitter: Transmitter Audio Tailoring: I.F. Transmit monitor
Delivery: Hopefully Late May/Early June: Price around £700: Send SAE for details

---

2M MULTIMODE FT 290R £249

inc VAT & carriage

Features include: LCD display: 10 memories.
Programmable Synthesiser steps: Dual V.F.O.: Clarifier
Full range of optional accessories.

FRG 7700 GENERAL COVERAGE RECEIVER

FRG 7700 £329 FRG 7700 with memory	£409
FRT 7700 Antenna tuning unit	£37.85
FRV 7700A VHF Converter 118-130, 130-140, 140-150MHz	£69.75
FRV 7700B VHF Converter 118-130, 140-150, 50-59MHz	£75.50
FRV 7700C VHF Converter 140-150, 150-160, 160-170MHz	£65.95
FRV 7700D VHF Converter 118-130, 140-150, 70-80MHz	£72.45
FRV 7700E VHF Converter 140-150, 150-160, 118-130MHz	£71.30
FRV 7700F VHF Converter 150-160, 160-170, 118-130MHz	£71.30
FF5 Low pass filter (500kHz) for improved VLF reception	£9.95
FRA7700 Active Antenna	£36.40

Prices include VAT @ 15%

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All prices correct at time of going to press E & OE

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Free Finance on many items. Two year guarantee on Yaesu. Free Securicor on major Yaesu items. Access and Barclaycard over the telephone. Biggest Branch, Agent and Dealers network. Ably staffed, courteous, Service Department. "B Services" Securicor contract at £3.90!! Biggest stocks of amateur equipment in UK. Twenty-four years of experience

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On regular priced items from: Yaesu, Ascot SMCHS, CDE, HyGain, Channel Master, Hansen, SMC, MFJ, KLM, Mirage and Hy Mound, on invoices over £100 SMC offers Free Finance! How is it done? Simple, pay 20%, split the balance equally over 6 months or pay 50% down and split the balance over a year.

You pay no more than the cash price!!

GUARANTEE

Yaesu's *own* warranty does not extend outside Japan. Repairs are the responsibility of the UK retailer. SMC's two year guarantee is backed, as UK distributors, by daily contact with the factory and many tens of thousands of pounds of spares and test equipment. Avoid hawkers offering sets without serial numbers, spares, service or advice back-up.

NEW YAESU HF MULTIMODE TRANSCEIVER FT102

Stop press—**FT102:**—For the ultimate signal + Rx front end operates on 24V and RF Stage (JFET) is bypassable extending the dynamic range over 100dB + Ultra Clean PLL system uses 6 narrow band VCOs + versatile IF shift/width system 2.7kHz→500Hz + wide variety of crystal filters for fixed bandwidths with parallel and cascade configurations + IF tunable notch filter + audio peak filter + new noise blanker with control of pulse width + microphone amp with tunable audio network adjustable to tailor response to individual voice characteristics before application to the superb internal RF speech processor + extra product detector allows AF monitoring of Tx IF signal + dual meters allows precise setting of processor and audio levels + peak hold ALC meter + 3 off 6146B in special configuration + DC fan whisper quiet + VFO uses custom IC module low component count within cast aluminium housing + external receiver provision + separate Rx antenna + AM/FM option module + full line of accessories + **FC102** Antenna Tuner:—1.2kW + single wire provisions, + 20 - 200 - 1,200W peak hold + separate SWR + Internal relays for push button selection + **FRA - 1 - 4R** waterproof 4 way switching box (inside FC102 or up tower) excellent isolation + **FV102DM** Synthesised scanning external VFO + 10Hz steps + fast slow scan + 12 channel memories + readout to 10Hz!! + keypad, knob or microphone control + **SP102** External speaker + large HiFi speaker + Selectable LPF and HPF for 12 possible response curves + stop.

E & OE

WIDE COVERAGE ALL MODE RX; FRG7700 £329 inc. VAT @ 15% & SECURICOR

- ★ 30MHz down to 150kHz (and below).
- ★ 12 Channel memory option with fine tune.
- ★ SSB (LSB/USB), CW, AM, FM.
- ★ 2.7kHz, 6kHz, 12kHz, 15kHz, @ −6dB.
- ★ 3 Selectivities on AM, squelch on FM.
- ★ Up conversion, 48MHz first IF.
- ★ 1kHz digital, plus analogue, display.
- ★ Inbuilt quartz clock/timer.
- ★ No preselector, auto seleted LPF's.
- ★ Advanced noise blanker fitted.
- ★ Antenna 500Ω to 2MHz, 50Ω to 30MHz.
- ★ 20dB pad plus continuous attenuator.
- ★ Switchable A.G.C. Variable tone.
- ★ 110 and 240Vac and 12Vdc option.
- ★ Signal meter calibrated in "S" and SIMPO
- ★ Acc.; Tuners, Converters, LPF, Memory.
- ★ FRT7700; 150kHz-30MHz, Switch, etc.
- ★ FRV7700A; 118-130, 130-140, 140-150MHz.
- ★ FRV7700B; 118-130, 140-150, 50-59MHz.
- ★ FRV7700C; 140-150, 150-160, 160-170MHz.
- ★ FRV7700D; 118-130, 140-150, 70-80MHz.
- ★ FRV7700E 118-130, 140-150, 150-160MHz.
- ★ FRV7700F 118-130, 150-160, 170-180MHz.
- ★ FF5; 500kHz (for improved VLF reception).
- ★ MEMGR7700; 12 Channels (internal fitting).
- ★ FRA7700; Active Antenna.

GENERAL COVERAGE RECEIVER; FRG7 £199 inc. VAT @ 15% & SECURICOR

- ★ 30MHz to 500kHz in One MHz bands.
- ★ SSB (LSB/USB), CW, AM.
- ★ Sensitivity AM; 0.7 μV 10dB S/N at 30%.
- ★ Selectivity; ± 3kHz at − 6dB.
- ★ Stability; 500Hz after 30 minutes.
- ★ Triple conversion, drift cancelling.
- ★ Direct frequency readout to 5kHz.
- ★ Fine tuning control.
- ★ AGC; DC amplified, 3 stage control.
- ★ AF; Powerful 2 watts of audio.
- ★ Forward facing internal speaker.
- ★ Record socket "volume independent".
- ★ Well calibrated "sharp" preselector.
- ★ AM automatic noise suppression circuit.
- ★ Antenna Hi to 1.6MHz, 50 ohm to 30MHz.
- ★ 3 position RF attenuator.
- ★ 3 position AF filter (LP, WBP NBP).
- ★ 110/240V and 12Vdc, ac.
- ★ Lights; battery economy switch.
- ★ Illuminated edge type "S" meter.
- ★ 2IC, 9FET, 13 Tr, 16D (9Ge, 5Si, 2Z).
- ★ Weight; 7Kg (without batteries).
- ★ Dimensions; 340W × 153H × 285Dmm.
- ★ Optional battery holder.

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FT ONE £1,295 inc. VAT @ 15% & SECURICOR

*Option

★ Rx: 150KHz-30MHz. Continuous general coverage.
★ Tx: 160-10m (9 bands) or 1.5-30MHz commercial.
★ All Modes: AM, CW, FM*, FSK, LSB, USB.
★ 10 VFO's!!! Any Tx-Rx split within coverage.
★ Two frequency selection ways, *NO* bandswitch.
★ Main dial, velvet smooth, 10Hz resolution.
★ Inbuilt keyboard with up/down scanning.
★ Dedicated digital display for RIT offset.
★ Receiver dynamic range up to 100dB!!!
★ SSB: Variable bandwidth *AND* IF shift.
★ 300* or 600Hz*, 2,400 → 300Hz, 6kHz*, 12kHz*.
★ Audio peak and notch filter. FM squelch.
★ Advanced variable threshold noise blanker.
★ 100W RF, key down capability, solid state.
★ Mains and 12VDC. Switch mode PSU built in.
★ RF processor. Auto mic gain control. VOX.
★ Last but not least *FULL* break in on CW.

FT902DM £885inc. VAT @ 15% & SECURICOR

★ 160-10 metres including new allocations.
★ Variable IF bandwidth 2.4kHz down to 300Hz.
★ Audio Peak and independent notch controls.
★ AM, FSK, USB, LSB, CW, FM, (Tx and Rx).
★ Semi-break in, inbuilt Curtis IC Keyer.
★ Digital plus analogue frequency displays.
★ VOX built-in and adjustable.
★ Instant write in memory channel.
★ Tune up button (10 sec, of full power).
★ Switchable AGC and RF attenuator.
★ Optional 350 or 600Hz CW, 6kHz, AM filters.
★ Clarifier (RIT) switchable on TX, RX or both.
★ Plug in modular, computer style constructor.
★ Fully adjustable RF Speech processor.
★ Ergonomically designed with necessary LEDS.
★ Incredible range of matching accessories.
★ Universal power supply 110-234V AC and 12V DC.

*Option

FT101ZD £635inc. VAT @ 15% & SECURICOR

*Option

★ 160-10 metres including new allocations.
★ Variable IF bandwidth 2.4kHz down to 300Hz.
★ Selectable CW fixed bandwidth CW-W and CW-N*.
★ Semi-break in with sidetone for excellent CW.
★ Digital plus analogue frequency displays.
★ 180W PIP and −31dB 3rd order intermod.
★ RF speech processor fitted − adjustable level.
★ VOX built-in and is adjustable from the front panel.
★ Wide dynamic range for big signal handling.
★ High usable sensitivity, for those weak ones.
★ Superb noise blanker − adjustable threshold.
★ Attenuator; 0-10-20dB, AGC; slow-fast-off.
★ Clarifier (RIT) switchable on TX, RX or both.
★ Low level transvertor drive output facility.
★ Universal power supply 100-234V AC and 12V DC*
★ Incredible range of matching accessories
★ 6 models: Digital/Analogue − AM/FM options.

FT107M £725inc. VAT @ 15% & SECURICOR

★ 160-10 metre (including 10, 18, and 24MHz).
★ USB-LSB-CWW-FSK-AM multi-mode.
★ Full broad band "no tune" power amplifier.
★ 240W PIP. 75 per cent power output at 3:1 VSWR.
★ 12 memory channels with clarifier on memory.*
★ Up/down scanning control from microphone.*
★ Variable IF bandwidth − 16 poles of selectivity.
★ Bandwidths: 6kHz*, 2.4kHz → 300Hz, 600Hz-300Hz*
★ Selectable CW "fixed" widths CW-W and CW-N.*
★ Tunable Audio Peak (AFP) and Notch filter.
★ Diode ring mixer for very high Rx dynamic range.
★ Noise blanker − front panel adjustable threshold.
★ AGC; slow-fast-off. Attenuator 0-20dB switchable.
★ RF speech processor fitted − front panel adjustable.
★ Digital (100Hz) plus analogue frequency displays.
★ Semi-break in with side tone. Vox built in.
★ Choice of built-in or separate power supply units*

*Option

FT707 £569inc. VAT @ 15% & SECURICOR

*Option

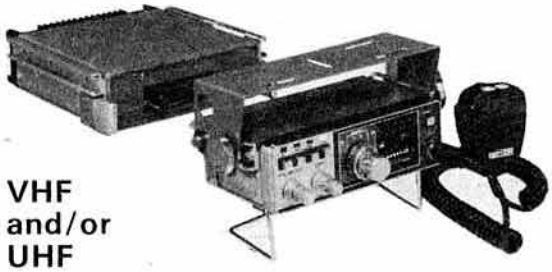
★ 80-10 metres (including 10, 18 and 24MHz bands).
★ USB-LSB-CWN-AM (Tx and Rx operation).
★ 100W PEP. 50% power output at 3:1 VSWR.
★ Full "broad band" no tune output stage.
★ Excellent Rx dynamic range, power transistor buffers.
★ Rx Schottky diode ring mixer module.
★ Local oscillator with ultra-low noise floor.
★ Variable IF bandwidth − 16 crystal poles.
★ Bandwidths 6kHz*, 2.4kHz-300Hz, (600-350) Hz*.
★ AGC; slow-fast switchable VOX built-in.
★ Semi-break in with side tone for excellent CW.
★ Digital (100Hz) plus analogue frequency display.
★ LED Level meter reads: S, PO and ALC.
★ Indicators for: calibrator, fix, int/ext VFO.
★ Receiver offset tuning (RIT-clarifier) control.
★ Advanced noise blanker with local loop AGC.

VHF/UHF MOBILES—FM or MULTIMODE

FT230R £239 inc VAT @ 15% & SECURICOR

- 25 watts RF output (Low 2·5W)
- 150 (W) × 50 (H) × 176 (D) mm. 1·3kg
- microprocessor controlled synthesiser
- Selectable 12½ or 25kHz steps
- Up/down, memory/band scanning
- Ten Memories with priority function
- Easy write in memory channels
- Large illuminated "any angle" LCD display
- Display to 100's of Hz & special functions
- Two independent VFO's
- Operation between memory and 'other' VFO
- Memory backup "5 year" lithium cell
- ±600kHz and or simplex
- Manual and automatic tone burst
- Large "full sound" speaker
- Concentric volume/squelch controls

FT720RV £245 inc VAT @ 15% & SECURICOR



VHF and/or UHF

FT720RV	Transceivers 2m 10W complete	245.00
FT720RVH	Transceivers 2m 25W complete	255.00
FT720RU	Tranceiver 70cms 10W complete	265.00
FT720R	Control head for transceiver deck	115.00
720RV	Transceiver deck only 2m 10W	130.00
720RVH	Transceiver deck only 2m 25W	140.00
720RU	Transceiver deck only 70cms 10W	150.00
S72	Switching box (between two decks)	55.00
E72S	Extension cable, 2m long	15.00
E72L	Extension cable, 4m long	20.00
MMB3	Mobile Mounting bracket for deck	5.00

FT720 Control Head
- Four easy write-in memory channels
- Rx Priority channel (auto check)
- Scanning, band/memory, empty/busy
- Up/down tuning/scanning from mic.
- Optically coupled tuning control
- Manual and automatic tone burst
- String LEDs for 'S' and PO, 7 status LEDs
- 1½W of audio to internal/external speaker
- 3·3 (4·3)" D × 6" W × 2 (2·2)" H

720RV 10W deck. **720RVH** 25W deck
- 144-146MHz (144-148MHz possible)
- 12½kHz synthesizer steps, 600kHz shift
- 0·3μV for 20dB quieting
- Rx 0·5A, Tx RV 3·5A, RVH 6·5A
- 5·8 (6·5)" D × 6" W × 2 (2·2)" D

720 RU 10W, 70cm, deck
- 430-434MHz
- 25kHz synthesizer steps, 1·6MHz shift
- 0·5μV for 20dB quieting
- Rx 0·5A, Tx 4·5A
- 5·8 (6·5)" D × 6" W × 2 (2·2)" D

S72 Switching box
- Pushbutton band change
- Auto change of steps/splits

FT480R (2m) £379 inc. VAT @ 15% & SECURICOR

- USB-LSB-CW-FM (A3j, A1, F3).
- 30W PIP A3j, 10/1 W out A1 F3.
- Bandpass filter no tune design.
- Bandwidth 2.4kHz and 14kHz at −6dB.
- Semi break in with side tone.
- Very bright blue 100Hz digital display.
- Display shows Tx & Rx freq (inc RIT).
- String LED display for "S" and PO.
- Digital receiver offset tuning.

- Advanced effective noise blanker.
- Memory scanning with slot display.
- Up/down tuning/scanning from mic.
- Priority channel on any memory slot.
- Satellite mode allows tuning on Tx.
- Scanning for busy or clear channels.
- Size (Case): 8.3" D, 2.3" H, 6.9" W.
- LED's; "On Air" Clar, Hi/Low, FM mod.
- Matching PP80 Mains PSU available.

FT780R (70cm) £449 inc VAT @ 15% & SECURICOR

- 144-146MHz (143.5-148.5MHz possible).
- Excellent dynamic range and sensitivity.
- FM; 25, 12½, 1kHz steps.
- SSB; 1,000, 100, 10Hz steps.
- Any TX Rx split with dual VFO's.
- ±600kHz standard repeater split.
- Four easy write-in memory channels.

FT480R

- 1·6MHz shift now available.

- 430-434MHz (440-445) possible.
- GaAs Fet RF for incredible sensitivity.
- NMOS four bit micro control.
- FM; 100kHz, 25kHz, 1kHz, steps.
- SSB; 1,000, 100, 10Hz steps.
- Repeater access by use of dual VFO's.
- Four easy write-in memory channels.
- FT780R 1·6 fitted 1·6MHz Shift **£459** inc.

FT780R

SPRINGTIME—TIME TO BE THINKING HAND PORTABLE

LOW PRICE

FT207R £169 inc.
VAT @ 15% & POSTAGE

- 144-146MHz (144-148 possible)
- 12.5kHz synthesizer steps
- 4 bit CPU chip for freq. control
- Keyboard entry of frequencies
- Keyboard lockout safety features
- Digital display to hundreds of Hz
- Display auto shutdown timer
- Four Channels of memory
- Memory back up, disable switch
- Up/down manual tuning

- Bandscan for busy or clear channels
- Memory scanning features
- ±600kHz split built in
- Any split + or − programmable
- Easy change NiCad pack
- BNC antenna connector
- "On Air" and "Channel Busy" LEDs
- Built in condenser microphone
- 200mW AF to internal/external speaker
- External speaker/mic available
- 2.5/0.2W of RF output
- Rx; 35mA squelch, 150mA full vol.
- Tx; 250mA low, 800mA high
- 0.3μV for 20dB quieting
- Double conversion 10.7MHz and 455kHz
- D.T.M.F. encoder built in
- 1.7 (2.2)" D × 2.5 (2.7)" W × 6.7 (7.2)" H
- C/w NiCad pack, helical and case

FT290R MULTIMODE PORTABLE/MOBILE £249 inc.
VAT @ 15% & SECURICOR

- 144-146MHz (144-148 possible)
- Multimode USB, LSB, FM, CW
- 2.5W PEP, 2.5W RMS/300mW out
- LEDs, "ON AIR", "BUSY" MC meter; S.PO
- Integral telescopic antenna
- Bandwidth 2.4kHz and 14kHz @ −6dB
- 100Hz backlit LCD Frequency display
- 10 memory channels "5 year" backup
- FM: 25kHz and 12.5kHz steps
- SSB: 1kHz and 100Hz steps
- Any TX/RX split with dual VFOs
- ±600kHz repeater split 1750kHz burst
- Up/down tuning from microphone
- AF output 1W @ 10% THD
- 58 (H) × 150 (W) × 195 (D) (1.3kg)
- Rx, 70mA, Tx; 800mA (FM maximum)
- Mobile bracket available

2 Yr. GUARANTEE AND FREE FINANCE AVAILABLE

★ FT790R SOON ★ (JULY)

FULL RANGE OF MATCHING ACCESSORIES

- Matching 10W linear Amplifier available
- 8.5-15.2V DC External (not included)
- 8 'C' NiCads or Drys (not included)
- SMC 2.2 A/Hr NiCad **£2.70** inc

FT208R (2m) £209 inc.
VAT @ 15% & POSTAGE

- 4 bit CPU chip frequency control
- Keyboard entry of frequencies/splits
- LCD digital display with backlight
- Ten channels of memory
- Memory back up five-year lifetime cell
- Up/down manual tuning
- Manual or auto scan for busy/clear
- Priority channel with search back
- Memory scanning feature
- Scan between any two frequencies
- Auto scan restart
- Quick change NiCad pack
- 1,750Hz tone burst
- Built in condenser microphone
- 500mW to int/ext speaker
- External speaker/mic available
- Keyboard offers 16 tone DTMF
- 168(H) × 61(W) × 39(D)mm
- C/w NiCad pak, helical

FT708R (70cm) £219
inc VAT @ 15% & SECURICOR

- 144-146MHz (144-148 possible)
- 12.5/25kHz synthesizer steps
- Any split + or − programmable
- ±600kHz repeater split
- 2.5 or 0.3W RF output
- Rx: 20mA squelch 150mA max AF
- Tx: 800mA at 2.5W RF
- 0.25μV for 12dB SINAD
- Dual conversion 16.9MHz and 455kHz

- 430-440MHz (440-450 option)
- 25kHz synthesizer steps
- Any split + or − programmable
- ±7.6MHz EU split standard
- 1W or 100mW RF output
- Rx; 20mA squelch, 150mA (max AF)
- TX: 500mA at 1W RF
- 0.4μV for 12dB SINAD
- Dual conversion 46.255MHz and 455kHz

FT208R FT708R

FREE FINANCE AVAILABLE—TWO YEAR GUARANTEE

SOUTH MIDLANDS COMMUNICATIONS LTD

S. M. HOUSE, OSBORNE ROAD, TOTTON, SOUTHAMPTON, SO4 4DN, ENGLAND
Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton

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hy-gain

The TH3jnr is a 3 element triband (10-15-20m) beam whose compact design (longest element 24·2ft, boom 12ft turning radius 14·3ft) makes it ideal where space is the limiting factor. Separate and matched air dielectric Hy-Q traps are used for each band giving a 52ohm fed with a 1·5:1 VSWR at resonance, 8dB Av gain, 25dB F.B. ratio and a power handling of 600W P.E.P. By using a 1¼in boom the antenna presents only 3·4sq ft of surface area (equals 87lb of load at 80mph). The mast to boom clamp accepts 1-1¾in masting and, like all the hardware, is Iridite treated to mil specs.

12AVQ	Vertical 10-20m inc.	**£43.13**	£1.73
14AVQ/WB	Vertical 10-40m inc.	**£58.08**	£1.73
18AVT/WB	Vertical 10-80m inc.	**£90.85**	£1.73
14RMQ	Roof mounting Kit	**£30.48**	£1.73
18V	Vertical 10-80m inc.	**£31.97**	£1.73
18HT	"HY Tower" 10-80m	**£320.85**	£12.54
103BA	3 Ele Yagi 10m	**£60.38**	£1.73
105BA	3 Ele Yagi 10m	**£112.70**	£3.16
153BA	3 Ele Yagi 15m	**£74.75**	£2.36
155BA	5 Ele Yagi 15m	**£135.13**	£4.77
203BA	3 Ele Yagi 20m	**£159.85**	£3.97
204BA	4 Ele Yagi 20m	**£217.35**	£5.87
205BA	5 Ele Yagi 20m	**£281.75**	£7.59
402BA	2 Ele Yagi 40m	**£201.25**	£5.23
DB10/15A	3 Ele Yagi 10-15m	**£146.05**	£3.91
TH3JNR	3 Ele Yagi 10-15-20m	**£159.28**	£2.47
TH2MK3	2 Ele Yagi 10-15-20m	**£136.85**	£2.59
TH3MK3	3 Ele Yagi 10-15-20m	**£205.85**	£4.66
TH5DXX	"Thunderbird" 5 Ele	**£228.85**	£5.41
TH6DXX	"Thunderbird" 6 Ele	**£281.75**	£6.97
HYQUAD	2 Ele Quad 10-15-20m	**£240.35**	£4.89
18TD	Dipole Tape 10-80m	**£80.39**	£2.30
BN86	Balun 1:1·3·30MHz	**£15.53**	£1.15
LA1	Lightning Arrestor	**TOS**	£0.75

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

SMC

COAXIAL 50 OHM CABLE		
URM95	Solid centre 2.2mm	£0.23
UR43	Solid centre 5.0mm	£0.23
UR76	Stranded core 5.0mm	£0.25
RG58U	Stranded core 5.0mm	£0.25
RG213	Low loss 10.2mm	£0.55
UR67	Low loss 10.2mm	£0.60
LDF450	Heliax ½" Foam p/m	£3.45
COAXIAL 75 OHM CABLE		
307EP	Economy Typic 4.3mm	£0.18
UR70	Stranded light	£0.28
UR39	Medium duty 7.8mm	£0.41
UR57	Low loss 10.2mm	£0.66
BALANCED TWIN CABLE		
302	75 Ohms light duty	£0.16
306	300 Ohms Ribbon	£0.17
N COAXIAL PLUG 50 OHM		
UG536	Small type 5.5mm	£2.70
UG21	Standard type 11.2mm	£1.32
L44W	Plug for LDF450	£11.50
N COAXIAL 'SOCKETS' 50 OHM		
UG58	Standard 4 hole fix	£0.94
UG1052	Free cable end 5.5mm	£2.86
UG23	Free cable end 11mm	£1.70
L44N	Free socket LDF450	£11.50
BNC COAXIAL PLUG 50 OHM		
UG88	Standard type 5.5mm	£0.74
UG959	Large type 11.2mm	£2.99
BNC COAXIAL SOCKET 50 OHM		
UG290	Standard 4 hole type	£0.76
UG1094	Nut fixing type	£0.71
UG89	Free cable-end 5.5mm	£0.94
BNC COAXIAL COUPLER 50 OHM		
UG914	Back to back female	£1.07
UG491	Back to back male	£1.66
UG274	'T' 2 female 1 male	£2.23
SMC 3F BNC	'T' 3 female	£2.02
UG306	Elbow, Male-Female	£1.86
BNC CABLES 50 OHM		
BNC18BNC	1.5' RG58 BNC ends	£2.55
BNC36BNC	3.0' RG58 BNC ends	£2.65
BNC36CROC	3.0' RG58 BNC/clips	£2.50

N.B. PRICES INCLUDE VAT AT 15%
Carriage: Cable £1.50 to 7 kg, plugs £0.50 any quantity

J-BEAM

FOUR METRES				
4Y/4M	Yagi, 4 element	7·0dB	**£22.43**	£1.73
PMH2/4M	Harness, 2 way		**£13.23**	£1.44
TWO METRES				
HO 2M	Halo, head only	3·0dB	**£5.17**	£0.63
HM 2M	Halo, 24in mast	3·0dB	**£5.75**	£0.75
UGP 2M	Ground Plane	0·0dB	**£10.92**	£1.73
C5 2M	Colinear omnivert	4·8dB	**£47.72**	£1.73
5Y 2M	Yagi 5 element	7·8dB	**£12.07**	£0.58
8Y 2M	Yagi 8 element	9·5dB	**£15.52**	£1.73
10Y/2M	Long Yagi, 10 element	11·4dB	**£33.35**	£1.73
14Y/2M	Long Yagi, 14 element	13·0dB	**£36.00**	£1.73
D5/2M	Yagi, 5 over 5 slot	10·6dB	**£21.85**	£1.73
D8 2M	Yagi, 8 over 8 slot	12·3dB	**£29.32**	£1.73
PBM10 2M	10 element parabeam	12·4dB	**£39.67**	£1.73
PBM14 2M	14 element parabeam	13·7dB	**£48.00**	£1.73
Q4 2M	Quad, 4 element	10·0dB	**£25.87**	£1.73
Q6 2M	Quad, 6 element	12·0dB	**£33.92**	£1.73
5XY/2M	Yagi, 5 element cross	7·8dB	**£24.72**	£1.73
8XY/2M	Yagi, 8 element cross	9·5dB	**£31.05**	£1.73
10XY/2M	Yagi, 10 element cross	11·3dB	**£40.82**	£1.73
PMH2 C	Harness, Cir. Polar		**£8.05**	£0.52
PMH2 2M	Harness, 2 way		**£10.92**	£0.86
PMH2 2ML	Harness, 2 way long		**£11.92**	£1.15
PMH4 2M	Harness, 4 way		**£25.00**	£1.73
SEVENTY CMS				
C8/70	Colinear vert.	7·8dB	**£54.05**	£1.73
D8/70	Yagi, 8 over 8 slot	12·3dB	**£22.43**	£1.73
PBM18/70	Parabeam 18 element	14·9dB	**£27.60**	£1.73
PBM24/70	Parabeam 24 element	dB	**£36.80**	£1.73
MBM28/70	Multibeam, 28 element	dB	**£18.40**	£1.73
MBM48/70	Multibeam, 48 element	15·7dB	**£31.05**	£1.73
MBM88/70	Multibeam, 88 element	18·5dB	**£42.55**	£1.73
8XY/70	Yagi, 8 element cross	10·0dB	**£36.80**	£1.73
12XY/70	Yagi, 12 element cross	13·0dB	**£46.00**	£1.73
PMH2/70	Harness 2 way		**£9.20**	£0.75
PMH4/70	Harness 4 way		**£19.55**	£1.44
TWENTY THREE CMS				
D15/23	15 over 15 slot	15·0dB	**£36.80**	£1.73
CR/23	Corner reflector	dB	**£35.08**	£1.73
PMH2/23	Harness 2 way	dB	**£27.60**	£1.73

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

Kenpro

KR600RC
£132.25

360° round type meter
Max. load 200kg.
Rot. 600kg/cm, brake
4,000kg/m.
1½in-2½in masts
Lower casting optional.

KR400RC

360° round type meter.
Max. load 200kg.
Rot. 400kg/cm, brake
1,500kg/cm
1½in-2½in masts.
Lower casting optional.

KR500

Elevation Rotator (180°).
Up to 50kg of Load.
1¼in-2¼in mast.
1¼in-1¾in boom.

KR250
£44.85

Twist and switch controller.
Rotator 200kg/cm.
Brake 600kg.
1in-1¼in masts.

NB: PRICES INCLUDE VAT AT 15%
Carriage free (post or road) mainland only

Channel Master

9508
£65·00

Auto control, secondary pointer gives position during travel. Stainless steel hardware. Heaviest duty "offset type". To 5sq

Takes 1-2" masts and 1-2" stub.

9502
£47·35

Automatic control box. Dial direction secondary pointer gives position during travel.

Takes 1-2" mast and 1-1⅞" stub.

Upper mast support bearing.

2" mast and 1¾" stub.

Post and packing **£1.20**
9523 **£14.38**

Rotary bearing 3-way guying.

Takes 1⅞" mast.

Post and packing. **85p**
9525 **£14.38**

NB: PRICES INCLUDE VAT AT 15%
Carriage free (or as shown) mainland only

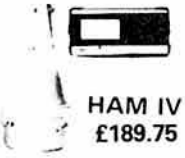
CDE

AR40
£65.55

Accurate, silent self-calibrating control box. Dial up desired beam heading, push knob; motor rotates to that position and then switches off.

CD45
£113.85

Large illuminated meter gives read out of antenna heading at all times. Armature brake. Low voltage meter. Handles antennas to 8½sq ft.



HAM IV
£189.75

Large illuminated meter gives read out of antenna heading at, all times. wedge solenoid brake mechanism. Handles antennas to 15sq ft.

T2X
£270.25

Large illuminated meter gives read out of antenna heading at all times. Wedge solenoid brake mechanism. Handles antennas to 30sq ft.

NB: PRICES INCLUDE VAT AT 15%
Carriage free (post or road) mainland only

SOUTH MIDLANDS COMMUNICATIONS LIMITED

BRANCHES: CHESTERFIELD · HUMBERSIDE · STOKE · LEEDS · BUCKLEY

VERSATOWER

TELESCOPIC & TILTOVER RADIO TOWERS 25-120 FT

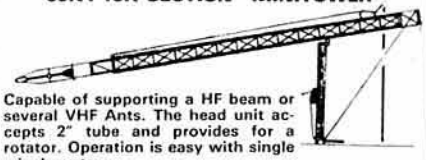
Below is a photograph of the versatowers chosen for the important approach lights for Manchester Airport. Be sure of quality and reliability by using the original Versatowers achieved through twelve years of continuous development which has produced a range of over 50 models, all of which, being made in England, conform to the current B.S.S., requiring minimum designed wind speeds of 85mph and up to 117mph.

Before purchasing a Tower, we strongly recommend consulting one of our engineers for advice regarding the most suitable combination for an installation. *It would be incorrect to nominate a specific headload as this is dependent upon load distribution, geographical location and siting.*

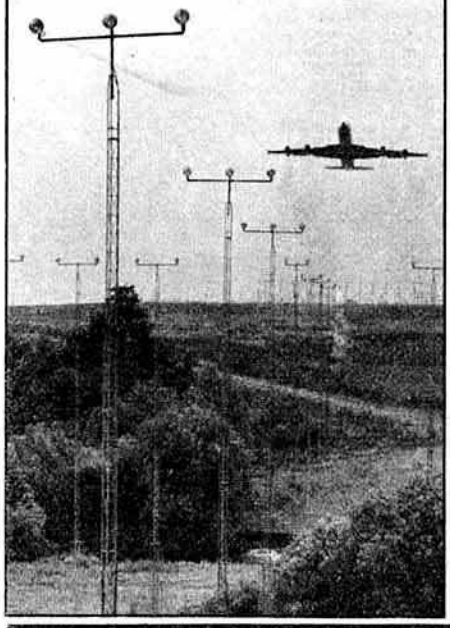
SEND NOW FOR SPECIFICATIONS/PRICES

They cost less than you would expect:
Post mounting 30ft inc. VAT **£388.35**
Post mounting 60ft inc. VAT **£533.83**

'30ft': 10ft SECTION "MINITOWER"



Capable of supporting a HF beam or several VHF Ants. The head unit accepts 2" tube and provides for a rotator. Operation is easy with single winch system.



HANSEN

IN LINE POWER/SWR BRIDGES P.E.P., R.M.S. 1·8–440MHz

The Hansen range covers 20 quaity models with top-of-the-line the FS710. This is a flat frequency response, peak envelope power and average in-line wattmeter with many novel features. Most notable being the 'power independent' SWR scale—no forward power calibration knob, just direct reading SWR.

FS710: PEP AUTO-SWR RMS LEVEL
FS710 £78.20

FS710H: 1·8-60MHz. 15, 150, 1·5kW
FS710V: 50-150MHz. 15, 150W
V.S.W.R: 4:1 and to 20:1
Accuracy: ±7% of FSD
Impedance: 50-52 Ohms
Connectors: SO239
Power: 240 Volts AC 50Hz
Weight: 3·lbs (1·5Kgs)
Size overall: 8 × 4 × 5½"
Size Meter: 2 × 3½"
Time Const: PEP follow 4 second

FS500 £60.95

PEAK READING LEVEL RESPONSE
FS500H 1·8-60MHz 20, 200 & 2kW
FS500V 50-150MHz 20 & 200W
Power ±7% FSD. SWR 1:1 5:1
Size: 8 × 4 × 5½"

FS600 £44.85

PEAK READING LEVEL RESPONSE
FS601M 1·8-30MHz 20 & 200W
FS601MH 1·8-30MHz 200 & 2kW
FS602M 50-150MHz 20 & 200W
FS603M 430-440MHz 5 & 20W
Power ±10% FSD. SWR 1:1 3:1
Size: 6½ × 2½ × 4½"

FS300 £40.25

LEVEL RESPONSE, LARGE METER
FS300H 1·8MHz 20, 200 1kW,
FS300V 50-150MHz 20, 200W FSD
Power ±10% SWR 1:1 3:1 ±10%
Size: 8 × 4 × 5½"

FS7 £35.65

VHF/UHF WATTMETER & BRIDGE
FS7 145MHz & 432MHz 5, 20, 200W
Power average ± 10%. SWR 1:1-3:1
Power Max: 144MHz, 200W
432MHz 20W
Size: 6½ × 2½ × 4½". 'N' type sockets

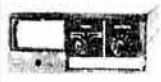
FS711 £32.20

REMOTE INDICATOR TYPE
FS711H 1·8-30MHz 20 & 200W
FS711V 50-150MHz 20 & 200W
FS711U 430-440MHz 5 & 20W
Power ±10% SWR 1 1-3 1 ±3%
Indicator 5 × 2½ × 1½"
coupler 3½ × 2½ × 1½"

FS5E £32.20

INDEPENDENT TWIN METER
FS5E 3·5 150MHz 20, 200 & 1kW
Power average ± 10%. SWR 1:1-5:1
Power Max: 1kW 3·5 30MHz
50W 50 150MHz
Size: 7 × 3 × 3½". 'On the Air' LED

FS300M £31.05



LEVEL RESPONSE, POWER & SWR
FS301M 1·8 30MHz 20, 200W
FS301MH 1·8 30MHz 200, 2kW
FS302M 50 150MHz 20, 200W
Power ±10%. SWR 1:1 3:1 ±3%
Size: 6½ × 2½ × 4½"

SWR3S £23.00

WIDE RANGE POWER & SWR
SWR3S 3·5 150MHz 20 & 200W
Power average ± 10%. SWR 1:1-3:1
Power Max: 200W 3·5 30MHz
50W 50 150MHz
Size: 6 × 2½ × 2½". Antenna/switch

SWR50B £23

TWIN METER, RELATIVE POWER
SWR50B 3·5 150MHz Scaled 1kW
Power average ± 20% SWR 1:1-3:1
Power Max: HF 1kW 1:1, 300W 3:1,
VHF 50W
Size: 6 × 2½ × 2½". 'On the Air' LED

NB· PRICES INCLUDE VAT AT 15%
Carriage free (surface post) worldwide

SMC-HS

HF, VHF, UHF ANTENNAS MOBILE VERTICALS

SMC-HS Mobile Antennas, tabulated below, feature an inbuilt PL259M connector, which mates with the SO239M on any of the four standard mounts. This arrangement is ideal for easy removal —band changes, comparative test, car wash, and anti-vandal, system checks from the feed point, portable operation and for ease of garaging etc. All models have fold over bases (either lift and lay or locking) except the 78B which has an inbuilt ball in case the mount is fitted askew.

Model	Band	Gain	Type	Power	Length	Price
20SE	20m		(½λ)	100W	1·72m	£13.80
15SE	15m		(½λ)	130W	1·72m	£12.65
10SE	10m		(½λ)	100W	1·72m	£12.65
4E	4m	0dB	½λ	150W	1·03m	£7.48
2H/PL	2m		(½λ)	50W	0·17m	£3.45
2QW	2m	0dB	½λ	200W	0·49m	£2.30
2VF	2m	3dB	⅝λ	50W	1·06m	£10.35
2NE	2m	3dB	⅝λ	150W	1·30m	£6.33
78SF	2m		(⅝λ)	100W	1·42m	£11.50
78F	2m	4·5dB	⅝λ	100W	1·75m	£11.50
78B	2m	4·5dB	⅝λ	150W	1·72m	£12.65
70N2M	2/70	2·7dB 5·1dB	(½λ) 2 × ⅝λ	100w	0·89m	£14.38
25B	70cm	5·5dB	2 × ⅝λ	100W	0.9m	£11.50
35B	70cm	6·3dB	3 × ⅝λ	100W	1·36m	£14.38

Model	Description	Price
SOWM	**Wing Mount.** SO239M upper SO239 under adjustable angle	£3.35
TMCAS	**Boot Mount** c/w 6 mtrs RG58 and PL259 plug	£7.65
GCCA	**Gutter Mount** deluxe cast type c/w 4 mtr cable assembly and PL259	£8.80
SOMM	**Magnetic Mount**c/w 4 mtrs RG58 and PL259 plug. *For use with smaller antennas only*	£8.45

An alternative mounting for any of the two metre antennas listed above is the BSD stainless steel bumper strap at **£7.75** plus the HS88BK extension tube at **£17.65** which raises by 80 cms and decouples the base of the antenna.

Also fitting the bumper mount is the 10 foot, 3 section (quick disconnect and fold over jointed) mobile colinear element which provides about 7dB of gain for **£28.35** (ills. right).

For operation on 2 metres and 70 cms the dual band 70N2M is an elegant solution particularly when combined with the HS770 diplexer which provides 50W power handling, 30dB isolation between transceivers with an insertion loss of only 0·5dB for **£13.80**.

Mainland delivery: accs. £0.65, antennas £1.73

NB: PRICES INCLUDE VAT AT 15%

S. M. HOUSE, OSBORNE ROAD, TOTTON, SOUTHAMPTON, SO4 4DN, ENGLAND
Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton
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Region 13—A. B. Givens, GM3YOR
Region 14—V. Kusin, GM4HCO
Region 15—J. T. Barnes, GI3USS. Tel 0247 3948
Region 16—T. D. Howe, G3PLF. Tel 0268 24453
Region 17—H. G. Cunningham, G8FG. Tel 0202 876018
Region 18—W. Ricalton, G4ADD. Tel 067 088 259
Region 19—R. J. Broadbent, G3AAJ
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These broadcasts are made every Sunday morning, giving almost complete coverage of the British Isles. Stations broadcasting them (particulars below) use the callsign GB2RS.

The purpose of these news broadcasts is to provide an outlet for amateur radio news items which cannot wait for the next issue of *Rad Com*. Items for inclusion should reach RSGB HQ by letter (marked "GB2RS news") or telephone before 10am on Wednesdays, although no guarantee of inclusion can be given. Once broadcast, items are not usually repeated.

INTENDED RECEPTION AREA	NORMAL READER	RESERVE READER	LOCAL START TIME
Frequency: 3·640MHz. Mode: ssb			
NE Scotland	GM3HGA	GM3VEY	1130
Frequency: 3·650MHz. Mode: ssb			
SE England	G2MI	G4ARZ	0900
Midlands	G2CVV	G8QZ	0930
SW England/Wales	G8ML	G3JFH	1000
Northern Ireland	GI3GAL	GI3SXG	1030
NE England	G5VO	G3MCF	1100
E Scotland	GM4CUZ	GM4FLP	1430
Midlands	G8QZ	G2CVV/G3SZJ	1800
Frequency: 3·660MHz. Mode: ssb			
Central Scotland	GM3TCW	GM3ULP	1130
Frequency: 7·0475MHz. Mode: a.m.			
UK (from Northern Ireland)	GI3GGY	GI2DHB	0900
UK (from N Midlands)	G3LEQ	G2CVV	1100
Frequency: 144·250MHz. Mode: ssb (horizontal polarization)			
N from Carlisle	G4LAA	(Vacancy)	0930
SW from the Midlands	G3BA	G3KQF	0930
NE from S Devon	G3CHN	G3PBV	1000
NW from Manchester	G3SMT	G4IAL	1000
NNW from Cleveland	G4JJB	G8FTZ	1000
W from Carlisle	G4LAA	(Vacancy)	1030
SE from Lincoln	G3NRO	G8OFQ	1030
SW from London	G3FZL/G3VAG	G3IIR	1030
S from Aberdeen	GM8GHV/GM8MBP		1030
W from Bristol	G4CJZ	G3ZWY	1100
W from Bangor, Co Down	GI3TLT	GI3SXG	1130
Frequency: 145·525MHz (S21). Mode: fm (vertical polarization)			
Cornwall	G2ABC	G3NPB/G3VGO	0930
Hampshire, north	G8CKN	G3PZN	0930
Suffolk	G3ZNU	G4FSG/G4FZZ	0930
Leeds	G3SPX	G8XGN	0930
Co Down	GI3WEM	GI4DOR	0930
Edinburgh	GM4EHO	GM4JFS	0930
E Cornwall/S Devon	G3ZYY	G4GWJ/G4KYY	1000
Londonderry	GI2DHB	GI4AHD	1000
London	G3FZL/G3VAG	G3IIR	1000
Birmingham	G3PWJ	G3BA	1000
Lincolnshire	G3NRO	G8OFQ	1000
Tyneside	G4FUT	G3WNR	1000
Glasgow	GM4HCO	GM4CXM/GM3VTB	1000
Elgin	GM4ILS	(Vacancy)	1000
Southampton	G8LVC	G8ADM	1030
E Sussex coast	G8SC	G3ZFE	1030
Bristol	G4CJZ	G3ZWY/G8NNU	1030
Manchester	G3LEQ	G3JWK	1030
Dumfries	GM8TKA	GM3MSG	1100
Brighton and coast	G3ZYE/G8GEZ	G4JGJ/MA	1100
Huntingdon, Cambs	G8BBK	(Vacancy)	1100
Jersey	GJ8KNV	GJ4ICD/GJ4JWA	1100H
Gwynedd	GW8TTM	(Vacancy)	1100
Clwyd/Merseyside	GW4IEQ	G8NNS	1100
Exeter	G3PBV	(Vacancy)	1130
Leicester	G4JYS	G4MFU	1130
Scarborough	G8XTL	G4EEV	1130

H = horizontal polarization

QTC
Amateur radio news

Regions 3 and 12 elections

The following valid nominations have been received for candidates to fill the vacancies of representatives for Regions 3 and 12 (notified in *Rad Com* March 1982):

Region 3
Mr L. W. Craven, G4EQI
Mr L. W. Ross, G8MWR

Region 12
Mr M. R. Hobson, GM8KPH
Dr C. V. Smith, GM4FZH

Not later than 30 July 1982, members residing in the regions concerned may vote for one candidate in the form prescribed below. Completed ballot forms, which must reach RSGB HQ by the above date, should be enclosed in a sealed envelope marked "Region . . . election" addressed to "The Secretary". The composition of the regions is **Region 3** Hereford & Worcester, Shropshire, Staffordshire, Warwickshire and West Midlands; **Region 12** Grampian, Highland, Island Authorities and Tayside.

FORM OF BALLOT PAPER

I,.....

being a fully-paid-up corporate member of the RSGB residing in Region....

wish to record my vote in favour of

Mr.....

as representative for Region.....

Signed.....Callsign or BRS No.....

Address.....

.....

The new licence schedule

In the supplement published in *Rad Com* April 1982, reference was made to ambiguities concerning modes and designations of emission which the RSGB hopes to resolve during a series of meetings with the Home Office. The ambiguities primarily relate to the use of rtty by Class B licensees. In the main body of the Class B Licence, the use of rtty is permitted, but there is no mode for it in the schedule (ie modes in the format "*1*" or "*2*"). This anomaly arises as a consequence of the new designator system, in which each mode is defined by the type of modulation, the nature of the modulating signal and the type of information being transmitted. This is an admirable system for station identification work, but difficult to apply to the amateur service. This rtty anomaly is appreciated by the Home Office, and it confirms that Class B licensees can use rtty. Perhaps the best way of logging rtty contacts is to write "rtty-fm" or "rtty-gm" in the log book!

Other areas which are complicated by the new designators of emission are atv and data. On atv the new schedule does not explicitly say how both sound and vision can be transmitted together. As far as data is concerned, the new footnote 18 permits data above 144MHz, but there are no modes available in the schedule itself (ie none in the format "**D"). These anomalies need to be resolved, as does the introduction of data on bands below 30MHz—there seems no obvious reason why internationally agreed CCIR codes could not be used on these bands.

The Society is therefore arranging a timetable with the Home Office so that the above anomalies can be resolved, and at the same time it also wishes to rationalize the multiplicity of footnotes in the present schedule.

Delays to licences

When the RSGB first heard about this problem from members, it was told by the Home Office that it would be resolved quickly. This has not turned out to be the case, and members have quite rightly asked why the Society has not exerted more pressure to resolve the Home Office's internal difficulties. There is no short-term answer to this type of problem, as cut-backs in the Civil Service have reduced staff at all levels. There seems to be nothing positive that RSGB can do to resolve these internal Home Office problems, but as we go to press we learn that long-delayed licences are now beginning to arrive.

Memorial donations for G2BVN

Since the death of Roy Stevens, G2BVN, last year, the Motor Neurone Disease Association has received over £1,000 donated in G2BVN's memory. These donations come from many national radio societies, including the RSGB, and individuals. The secretary of the Motor Neurone Disease Association, Mrs Ann Gretton, wishes to thank all those who have made such generous donations to the fund.

Should any other member wish to make a donation, this can be done by writing direct to the MNDA at 7 Lorimer Avenue, Gedling, Nottingham, NG4 4BN.

Urgent—FAI on 144MHz

Dr G. H. Grayer, G3NAQ, writing from Geneva, seeks the assistance and co-operation of someone with a station having good eme performance. He wishes to set up a path between Geneva and the UK to investigate the use of field aligned irregularities on 144MHz during the forthcoming summer months. Some work has already been done on this by K4GFG (see *QST* January 1982, pp30-2).

Experienced eme operators who would like to join Geoff Grayer in this, can write to the Propagation Studies Committee at RSGB headquarters.

Stolen equipment

From a car in Kinson, Bournemouth, on 16 April 1982, a Trio multimode transceiver TR9000, serial number 0083478. Information to G3VBL, QTHR, or to Bournemouth police.

Each January the Hunting Lions on the Air Contest is arranged by the Lions Club of Arpoador (Rio de Janeiro) to mark the birthday of the organization's founder, Melvin Jones.

Mrs A. C. Clarricoats

The Society was sorry to learn of the death on 26 April of Mrs "Cissie" Clarricoats, aged 86, widow of John Clarricoats, OBE, G6CL, secretary of the RSGB 1930-1963.

Many older members will remember the warm welcome they received from Mrs Clarricoats during visits to the G6CL QTH in pre-war and wartime days; and others will recall the visits she made with G6CL to amateur radio functions around the country.

More power for the HW7

by JOHN ROSCOE, G4QK*

IT MAY SEEM an odd idea to purchase a commercial QRP transceiver for the express purpose of building a 50W cw rig. For those who are not primarily interested in telephony, however, the availability of several types of QRP outfits on the secondhand market at perhaps one-twentieth of the price of a new ssb transceiver is not without interest. There is little enough to go wrong with them, so they should be a good buy. When an HW7 turned up locally for sale, the author bought it with the deliberate intention of adding an amplifier, and as cheaply as possible.

The HW7 that he acquired appeared to have been well assembled, and came complete with an HWA-7-1 mains unit. The transmitter was virtually unmodified, but the receiver had been fitted with an rf stage and a double-balanced product detector. The modification was suggested by W1CER in *QST* January 1974, and in this case had been skilfully executed. In the event it provided a three-band receiver with good sensitivity, if not the last word in selectivity, and a watt or two of rf with semi-bk switching and sidetone. The stability of the HW7 was impressive, particularly to one brought up on valve oscillators: key down on full load it held an *eight-digit* counter without a blink. As received, it was put on the air on 21MHz and produced an immediate 599 report from UA3—and 9-plus complaints of tvi from the rest of the household.

"Valves are still incomparably more suitable than rf power transistors for home-built transmitters of more than a few watts output", *Technical Topics* December 1981. The valves that are likely to be available for building an rf amplifier fall simply into two groups: large and small. Of the large valves the 6146 would be ideal, but few people are in a position to classify it as "junk". The next most obvious choice is the 807. Many of the tv line output valves would be suitable, except that most of them were intended for series operation of the heaters. The PL38, for example, will handle a lot of power, but the heater requires an inconvenient 300mA at 30V. Fortunately the same valve is available as the EL38 with a 6·3V heater. Some of the octal-based audio output valves could certainly be pressed into service, but might be unhappy at high anode volts. Among the small valves the rf and audio types such as the 5763 and EL84 cannot really be extended beyond 50mA at 350V, or 17·5W. Most of the smaller tv line output valves, again, were intended for series heater operation; the PL81 and PL820, for example, having a 21·5V heater. Fortunately the PL81 was also produced as the EL81 with a 6·3V heater, and it was decided to use a pair of these.

Data for the 807 are readily available: it has an anode dissipation of 30W, and with 0·2W drive will give an output of 30W in Class B or 50W in Class C. Individual examples of the valve can easily be 40 years old, however, and may not have survived too well. It is rare to find published data for rf applications of time-base output valves, so they must be determined experimentally. The EL81 has a noticeably smaller anode than the 807, but more emission, at 180mA cathode current against 125. Its all-glass construction means that it keeps going well (too well!) past 42MHz, whereas the 807 is really fading out at 30MHz. In the last NFD to be run under the restricted power ("2E26") regulations, a single EL81 (with base adapter) was plugged into a transmitter in place of two 6146s without any circuit alterations, and handled 35W at 800V for 24h—and survives to this day. It did not show signs of overheating (creeping grid current rather than holes in the anode!) until driven to 50W or even 55W, so the anode rating for amateur use (ICAS) can certainly be taken as 12W, rather than the published figure of 8W. In time-base operation the anode will stand a 7kV peak, so nothing will spark over, but any attempt to reach this figure in cw operation would tear lumps out of the oxide coating of the cathode.

The idea, then, was to build an amplifier with a pair of EL81s running quite gently around 100mA at 500V. With the relatively generous driving power available, a passive-grid circuit seemed feasible: this circuit has the advantage of requiring no neutralization. The only decision required was the size of the grid resistor, which must be large enough to develop the required drive voltage, but not large enough to introduce feedback and instability: a 1,000Ω resistor was selected. It was also decided to use fixed bias, which simplifies the circuit of the amplifier, at the expense of some additions to the power supply.

The circuit (Fig 1) is straightforward. The input consists of a tuned L-section to step up the impedance from 50 to 1,000Ω. A broadband transformer would be simpler, but was not used because of the tvi performance of the HW7. The input could be a single tapped coil or, as chosen, three separate coils. If the grid blocking capacitor is too large, the input circuitry may not load properly at 21MHz. The input can be tuned for maximum drive, but a neater method is to use an swr meter to ensure that the HW7 "sees" 50Ω. Three ferrite beads were put on each grid lead, right up against the valveholder, and a small anti-parasitic choke, consisting of five turns of 20-odd gauge enamelled wire evenly spaced over a 100Ω 0·5W resistor, right against each anode connection. The amplifier has not been tried without these precautions, but is completely stable under all conditions with them. To save space, a small loading capacitor was used in the pi-tank circuit, with a parallel fixed capacitor switched in for 7MHz.

One of the problems with direct-conversion receivers is their susceptibility to hum. The most useful suggestion, from N1JA (*Technical Topics* November 1981), is to bypass the rectifiers in the receiver power supply with 0·01μF capacitors. In addition, care must be taken to avoid earth loops, for example by disconnecting the earth pin on the HW7 mains plug, and a transformer with a Faraday screen should be used for the amplifier power supply if available.

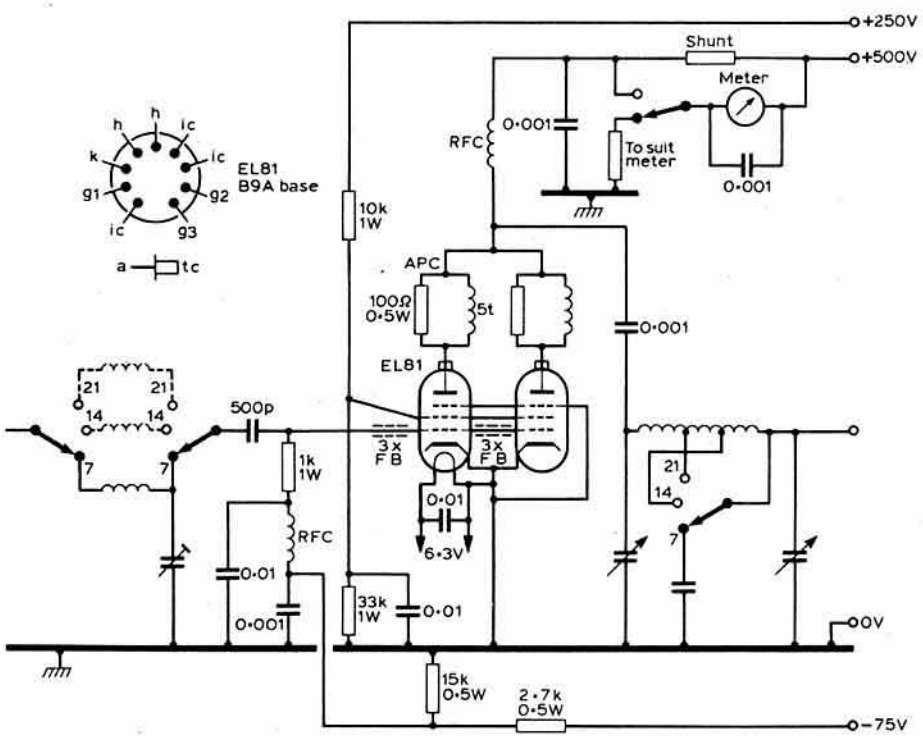


Fig 1. 50W amplifier

*27 Northfield, Bridgwater, Somerset TA6 7HA.

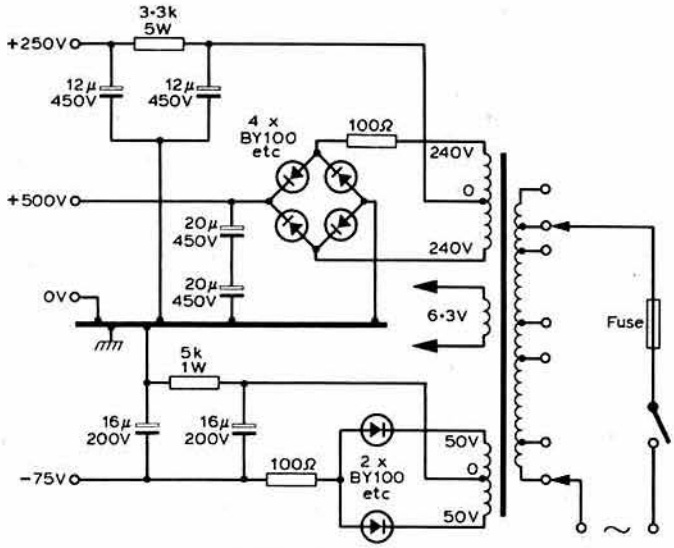


Fig 2. 50W power supply

At the design stage it was considered—rightly—that the valves in the amplifier would contribute noise unless completely cut off. The simplest remedy for this was to use manual control and break the G2 supply with the t/r switch. With a view to operating on less predictable mains supplies (in, for example, NM55), the anode current meter was switched to read the ht voltage, on the assumption that when the (multi-tapped) mains transformer primary was giving the right ht voltage then the heater voltage would also be correct.

In any project of this type the details of construction are inevitably dictated by the components available. The unit was built into a box 8(w) by 6 by 6in, ex-US Signal Corps, with a new front panel. The power supply was mounted in the box, and the rf components on a flat sheet of aluminium attached to the panel by a bracket. The grid components were mounted under this chassis and the anode components on top, with no attempt to gang the band-switching in the two circuits. The grid coils were wound on 0·25in formers of the type that are used in pairs in some i.f. transformers. The anode coils should be 16g or heavier, either wound on ceramic or self-supporting; though 30g on cardboard would produce *some* result. It is well worth experimenting with the position of the coil taps, measuring the output into a dummy load. The voltages quoted are only approximate, as the bias required will obviously depend on the G2 volts. The simplest method of adjustment is to increase the bias with the key up until the anode current is just cut off. The self-imposed limit of 50W can certainly be exceeded without damaging the valves, but at some point a fan will be required to dissipate the heat. As the valves are not being driven fully into Class C, the output is probably a little over 20W. The weight of the amplifier, determined largely by the transformer, is on the high side at 9lb, which means that /A operation is likely to be carborne rather than airborne.

Two main types of circuit can be considered for the power supply. The bridge rectifier used (Fig 2) is an efficient method of getting a lot of power out of a small transformer, but can produce inconveniently high voltages from transformers that were intended to allow for the drop across a valve rectifier; and some cheap-and-nasty transformers will short down to frame if used in a bridge circuit. For higher voltage transformers a biphase rectifier (Fig 3) may prove more suitable. Where rectifiers or electrolytic capacitors are used in series, suitable selection may turn up matched components that

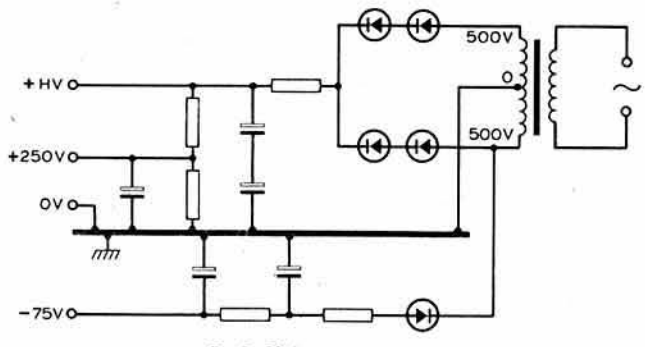


Fig 3. Biphase rectifier

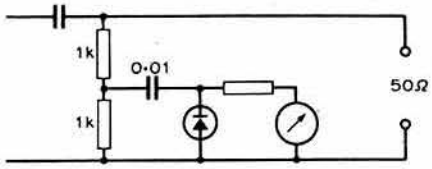


Fig 4. HW7 output meter

can be used without load-sharing circuits; though the voltages both on and off load should be checked periodically, to take care of ageing. The bias supply may be obtained from a separate winding (or transformer) or from a tap on the main secondary winding. As a rough guide, a bridge rectifier will produce about twice the ac input voltage on load, and anything up to three times that voltage off load.

A second, larger unit was built along the same lines, using a pair of 807s in a larger case (ex-19 set). The 350-0-350 transformer and bridge rectifier gave over 1,000V off-load, so oil-filled capacitors were used to ensure peace of mind. The G2 supply was stabilized with a VR150/30 and a VR105/30 in series, in order to give a sharper cut-off. The 807s were mounted on the chassis, with no attempt to screen the lower portion of the valves, and once again the amplifier proved completely stable. The 807 is a robust valve, and to obtain the maximum output from the available drive the bias was lowered until the valve anodes glowed dully on a soak test. An antenna changeover relay was included to give semi-bk operation from the HW7.

The modifications to the HW7 consisted chiefly of providing separate antenna connections for the transmitter and receiver. At the same time tv coaxial connectors were fitted, as the author does not share the American fondness for using phono connectors at rf. A pair of (rectifier) diodes, one facing each way, was connected across the receiver input to safeguard it against accidental overload. The transmitter output was taken from the blocking capacitor (C44) by pulling the lead out of the printed circuit. This same action disconnected the rf output meter—when, not unexpectedly, the tvi disappeared.

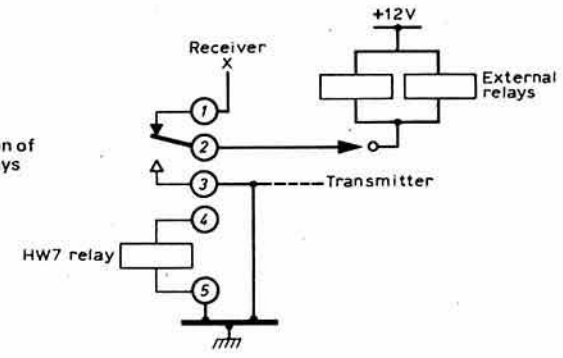


Fig 5. Operation of external relays

It is interesting to observe that a diode operating at such low power levels (Fig 4) can produce enough second harmonic to interfere badly on the 38MHz tv i.f.. In use the output tuning should be kept on the high capacitance side (anti-clockwise, low numbers) to reduce harmonic output: if tvi persists, a low-pass filter can easily be fitted in the lead to the amplifier. The internal relay in the HW7 can be used to switch other relays, and the Heathkit mains supply unit has spare capacity to power them. The simplest way to arrange this is to earth the original "transmit" contact (and the rf meter with it), and connect the earthy side of the external relays to the moving contact of the HW7 relay (Fig 5).

The results obtained with the small unit have been fully up to expectation. In a short time, and using a simple wire antenna, contacts have been made on 14MHz with FY7, JA (S8), KL7, LU, UA9, W and ZL; and on 21MHz with FY7, OH0, PY, UJ8, UA9, all districts W and 8P6 (S9). The most conspicuous failure was a KH0, who thoughtfully sent "up" at each over: the author is still undecided about fitting rit to the HW7. In all fairness it cannot be said that the larger unit, with more than twice the power, produced better results, and the lower-power version is certainly more satisfying to use.

One useful feature of the HW7 is that the receiver tunes continuously from under 7MHz to over 21MHz. Those who are prepared to do without the 7MHz band can contemplate converting the transmitter to work on 10·1MHz. Preliminary tests show that lowering the 7MHz vfo from 3·5 to 3·3MHz with a parallel capacitor, with a view to tripling to 10·1MHz, gives rather better bandspread than that on 21MHz.

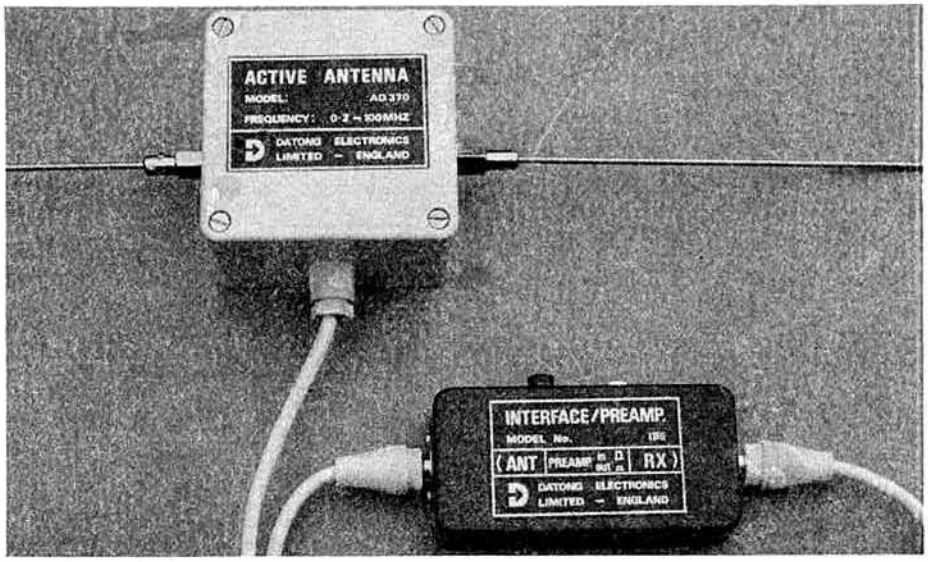
The total cost of constructing these two units was nil—apart from solder and electricity. □

EQUIPMENT REVIEW

Datong AD370

active antenna

by P. J. HART, BSc, G3SJX*



AN ACTIVE ANTENNA is essentially an electrically-short antenna which incorporates a low-noise amplifier to provide an efficient impedance match from the antenna to the receiver. An electrically-short antenna will yield a signal voltage roughly proportional to its length. As most receivers are sufficiently sensitive for incoming signals and band noise to completely mask receiver noise, a short antenna is invariably sufficient to receive all signals that would be received on a $\lambda/2$ dipole at the same height. As the frequency is lowered, such an antenna becomes progressively shorter and the signal pick-up compared with a $\lambda/2$ dipole becomes progressively lower. However, the margin between received signal level on the larger antenna and receiver noise becomes progressively greater and hence effective results are still obtained. The net result is a signal input to the receiver which has much less variation with frequency than would be obtained with a full-size antenna. An electrically-short antenna connected directly to the 50Ω impedance input of most receivers would give poor results due to the impedance mismatch involved. A short antenna has a high, capacitive impedance, and a suitable impedance converter such as a fet amplifier is required.

The Datong active antenna comprises a balanced dipole of 3m total length together with an active head unit to match to a 50Ω coaxial feeder. Eight metres of cable are provided. An additional interface/preamp unit located at the receiver feeds power to the head unit and provides for additional gain if required. The system is broadband with a flat frequency response from 200kHz to 30MHz. Useful performance down to 100kHz and up to 100MHz is claimed. Two versions are available with identical electrical specifications. The AD370 is engineered for outside use and the AD270 is intended for indoor use only.

Description

The AD370 head amplifier is housed in a watertight plastic box measuring 80 by 82 by 55mm with a gasket-sealed lid and watertight gland for the coaxial feeder. The two 1·5m stainless-steel whip elements are self-supporting. The AD270 indoor version uses flexible wire elements. The interface unit is housed in another plastic box measuring 99 by 49 by 25mm fitted with Belling Lee tv-style input and output connectors and, in common with other Datong equipment, a 3·5mm jack for power. A short-circuit-proof power supply is essential as the power lines are momentarily shorted when this jack is connected or removed. The total power requirements are 11 to 14V unstabilized at 140mA. Single-sided glass-fibre printed boards are used in both units.

A balanced dipole is used together with a push-pull head amplifier to eliminate ground connection requirements and prevent signal and interference pick-up on the feeder. Hence the antenna may be mounted remotely, if necessary at some considerable distance, from sources of noise and interference. The polar diagram is diplole shaped with nulls off the ends of the whips, and vertical or horizontal polarization may be achieved by suitable mounting.

A differential head amplifier is used to reject common-mode signals (largely feeder pick-up) and a two-stage design is employed. The first stage uses push-pull J310 large signal junction fets in common source configuration, with negative feedback applied between drain and source through the use of wideband ferrite transformers. The second stage uses push-pull ZTX327 large-signal bipolar transistors in common emitter, with similar transformer-coupled negative feedback between collector and emitter. A 1:1 isolating transformer connected from collector to collector feeds the output signal via a balun transformer to the coaxial feeder. Power is fed to the head unit via the feeder. Both stages are operated at a relatively high current and this, together with the negative feedback and suitable devices, ensures a low-noise amplifier with particularly wide dynamic range. Good strong-signal handling is essential as there is no selectivity and the amplifier has to cope with all signals from long waves through to Band 2 fm.

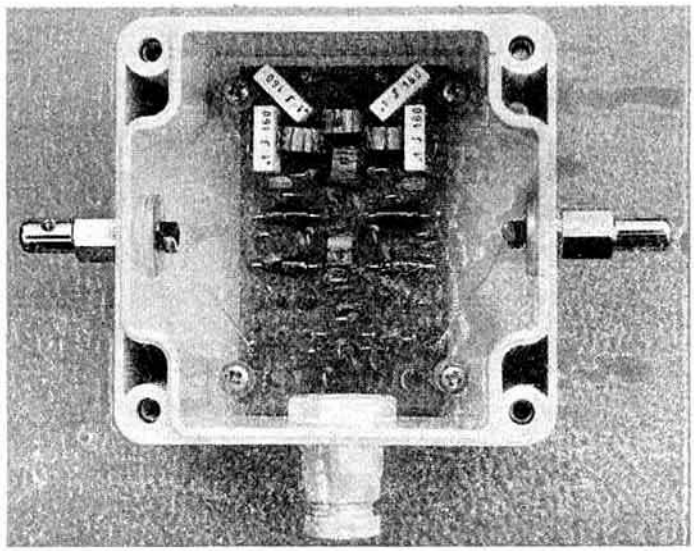
The interface unit incorporates a switchable 12dB gain preamplifier and filtering to connect power to the coaxial feeder. This preamplifier uses a ZTX327 single-ended common-emitter amplifier with transformer coupled negative feedback from collector to emitter.

Measurements

All measurements were performed with the AD370 powered from the MPU Datong power supply and using a Hewlett Packard 8568A spectrum analyser as the receiver. Due to the high impedances involved at the input to the head unit and likelihood of extraneous signal pick-up, all measurements were performed in a screened cage.

DC measurements

The MPU psu delivered 11·3V when supplying the 120mA current drawn by the head unit and the preamplifier. Of this 120mA, the head unit consumed 75mA.



Interior view of the head unit

*42 Gravel Hill, Addington, Croydon CR0 5BD.

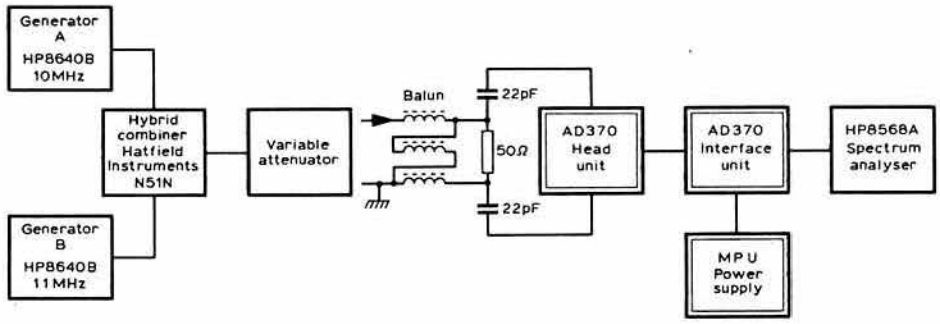


Fig 1. Intermodulation distortion measurement of AD370

Impedance measurements

No attempt was made to measure the input impedance of the head unit, as no suitable balanced impedance measuring equipment was available. The input impedance of the interface/preamplifier unit was measured using a Hewlett Packard 4815A vector impedance meter as 36Ω at +6° phase angle (slightly inductive) at 1·8MHz rising to 59Ω at +46° phase angle at 28MHz.

Overall gain

Gain measurements were made by connecting the output of a Hewlett Packard 8640B signal generator through a balun transformer and 50Ω terminating resistor to the input of the AD370 head unit. The voltage gain of the head unit was measured as 2·5 times and virtually flat across the frequency range 1·8 to 30MHz. The power gain of the interface/preamplifier unit was measured as 11dB at 1·8MHz reducing to 10dB at 30MHz.

Signal handling

Measurements of second-order and third-order intermodulation distortion were made using the arrangement shown in Fig 1. The 22pF capacitors were used to simulate the input capacitance of the whip antennas. The signal generators were tuned to 10MHz and 11MHz respectively and set to the same amplitude. Third-order distortion measurements were made by measuring the amplitude of the distortion products at 9MHz and/or 12MHz and second-order distortion measurements were made by measuring the amplitude of the product at 21MHz. Whereas third-order products are generally considered more important when evaluating receiver performance because they can occur within the front-end selectivity, second-order products become equally important in wideband systems. The third-order output intercept was measured as +35dBm with the preamplifier switched out, and +27dBm with the preamplifier switched in. This is virtually identical to the figures quoted in the AD370 data sheet.

The second-order distortion performance was very good indeed and could not be measured. The test arrangement limited second-order intercept point measurement to about +50dBm, due to intermodulation occurring within the two signal generators. The data sheet claims +66dBm second-order output intercept with the preamplifier switched out, and +46dBm with the preamplifier switched in.

Sensitivity

It is difficult to quote a meaningful figure for sensitivity of an active antenna. With the whips removed, the noise output of the head amplifier with the preamplifier switched out was related to the output of a noise generator and found to be 16dB above thermal noise. In practical use, band noise was audible at 30MHz when used in conjunction with an average receiver.

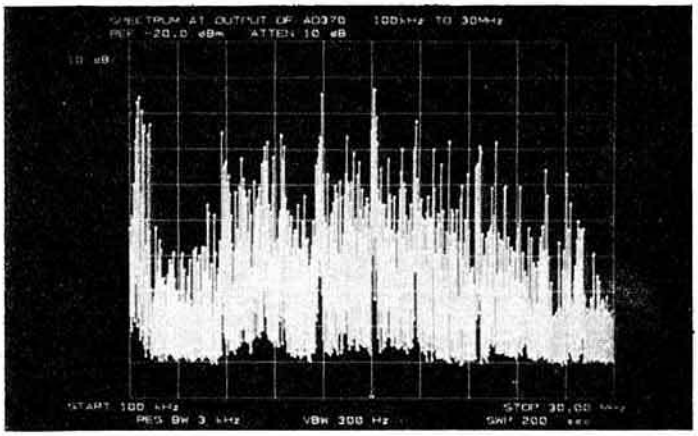


Fig 2. Spectrum at the output of the AD370 between 100kHz and 30MHz

Output spectrum

Fig 2 shows the output spectrum between 100kHz and 30MHz of the complete active antenna with the preamplifier switched in. The head unit and whips were attached to a short pole and suspended horizontally out of a window about 6m above ground level and rather close to pipework and guttering. The photograph was taken around 2pm on a day in April. The horizontal scale is 3MHz/division, the vertical scale 10dB/division, and the top reference line −20dBm. The broadcast bands can be clearly identified, with the strongest signals around −30 to −40dBm at the output of the preamplifier occurring in the 15 and 12MHz bands and in the medium waveband. The 28MHz band was clearly open, and 27MHz well populated. A photograph taken later in the evening would show much higher levels at the lower frequencies and closed bands at the higher frequencies.

Comparison with larger antennas

The AD370 was evaluated in conjunction with an FT-ONE and an AR88 receiver, and direct comparisons made with the G5RV multiband dipole and DX33 three-element triband hf beam normally used by the reviewer. These two antennas are mounted remotely from the house and fed through 80m of RG8/U coaxial cable and a remote mounted coaxial relay. Several decibels of feeder loss are experienced on 21 and 28MHz. The DX33 was used at a height of 8m. The G5RV 102ft dipole is at a height of 15m, and is fed with 9m of 300Ω ribbon followed by 75Ω twin feeder to ground level where it is connected to the coaxial relay via a broadband balun.

The AD370 was mounted horizontally polarized on a pole on top of a chimney about 10m above ground level and well away from the other antennas.

The following comparisons were made; in all cases the comparative signal levels are given with the AD370 preamplifier switched in:

1·8MHz. The G5RV does not work properly at this frequency, and the AD370 gave signal levels about 10dB stronger than the G5RV. DX signals were considerably superior on the AD370.

3·5MHz. The G5RV gave signals about 10dB stronger than the AD370, and the G5RV was superior on resolving weak signals.

7MHz. Little to choose on general performance. Signals on the G5RV were about 5dB stronger.

10MHz. The G5RV and AD370 gave similar results and signal levels.

14MHz. The signal levels produced by the AD370 and G5RV were similar but the G5RV gave a quieter background noise level. Operation with the preamplifier switched out was generally preferable. The DX33 was superior by some 6dB or more.

21 and 28MHz. The G5RV does not work particularly well at these frequencies, and the AD370 gave some 10 to 30dB stronger signals. Signal levels were similar to those with the DX33, but the beam produced a rather quieter background as might be expected. Much dx was heard on these bands on the AD370, including many VK, ZL and VR6TC.

Just noticeable tv buzz was audible with the AD370 on the chimney. Mounted indoors, interference from fluorescent lights and tv timebase was somewhat more pronounced, particularly at the lower frequencies. As with all antennas, it pays to mount them away from the house environment and in the clear. Operation with the preamplifier switched out was generally preferred.

Conclusion

The reviewer was impressed by the performance of this active antenna. As a general-purpose antenna for the swl with restricted space it is particularly useful. The unit comes with instructions and hints on mounting but no circuit details. The price of the AD370 is £51.75 incl VAT, or £56.35 if purchased with the MPU mains power unit. The AD270 indoor version is £37.95 incl VAT, or £42.55 if purchased with the MPU.

The items used in this review were loaned by Datong Electronics Ltd, Spence Mills, Mill Lane, Bramley, Leeds. □

Sideband power measurement

by G. L. BENBOW, G3HB*

IN ORDER TO UNDERSTAND the problem of ssb power measurement, it is useful to examine some of the ideas about amplitude modulation (a.m.). Amplitude modulation is the variation of the amplitude of the rf carrier wave produced by the transmitter. This is achieved by the audio frequency (ie speech) modulating waveform being amplified in the modulator and impressed on the pa power supply via the modulation transformer. The resulting waveform is the familiar modulation envelope shown in Fig 1. Amplitude modulation produces frequencies known as sidebands on either side of the carrier wave, as shown in Fig 2, another familiar diagram. These sidebands are related to the carrier (rc) and modulating (rm) frequencies. The power level of an a.m. transmitter was usually determined by measuring the input power to the output stage, ie the product of the voltage applied and the current drawn by the device(s), be they thermionic or semiconductor, in the power amplifier. The new licence schedule has changed this to 20dBW (100W) carrier power supplied to the antenna, but this does not affect the measurement technique for ssb.

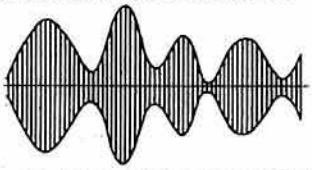


Fig 1. Waveform of an amplitude modulated transmission (modulation envelope)

Fig 1 shows that an increase in the amplitude of the modulated waveform is followed immediately by a decrease; thus an increase in the current drawn by the pa is followed by a decrease. The current drawn by an amplitude modulated pa as measured by the pa current meter is therefore constant; any variation in this current indicates non-linearity or maladjustment of the pa. The input power is simply the product of a constant voltage and a constant current, and is very easy to measure.

Referring again to Fig 2, both sidebands contain the same intelligence and as the carrier wave contains no intelligence, no intelligence is lost if the carrier wave is suppressed and one or other of the sidebands is eliminated. By this process the familiar single sideband (ssb) mode of transmission is obtained.

Now, a more complex situation arises, the current drawn by the pa is no longer constant, it varies at a syllabic rate. A typical pa input current waveform of an ssb transmitter is shown in Fig 3. The output waveform will be the same; Fig 3 shows that only one thing can be defined about this waveform, ie, its maximum or "peak" value, which does not occur often. Any other value, such as the rms or the average, which could be applied to a sinusoidal waveform is meaningless, as the waveform is not regular, but depends on the voice pattern (male or female voice for instance) and the syllables being spoken.

The syllabic variations in the current which are represented by the waveform of Fig 3 are too rapid for it to be measured in the usual way. The pointer-type meter is much too sluggish in operation and would only indicate 50–70 per cent of the peak value. Consequently, the input power of an ssb transmitter cannot be measured in the same way as that of one which is amplitude modulated.

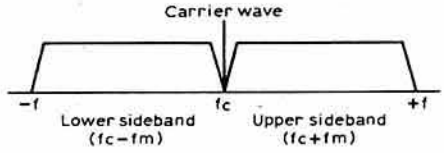


Fig 2. Carrier wave and sidebands of an a.m. transmission (f_c is the carrier frequency, f_m is the modulation frequency)

An alternative way of determining the power level of an ssb transmitter is to measure its output power and, in fact, this is the method prescribed in the UK amateur licence. The power defined in the licence is the peak envelope power (p.e.p.). A certain amount of confusion arises now, because this is not peak power as defined in an electrical engineering text book, but it is the real (rms) power at the instant of the peak of the modulation envelope. The maximum value of the p.e.p. permitted by the UK amateur licence is 400W (26dBW), which is related to the former 150W input figure for a.m. as follows. If the efficiency of the output stage is assumed to be 66·66 per cent, the output power is 100W. When the transmitter is modulated to a depth of 100 per cent, the peak amplitude of the modulation envelope is twice that of the unmodulated carrier wave. The power output in the unmodulated case is V^2/R, where V is the unmodulated carrier amplitude (in volts) and R is the value (in ohms) of the dummy load on the transmitter output. As the amplitude of the carrier wave is doubled when the modulation level is 100 per cent, the power becomes $\frac{(2V)^2}{R}$ or 4. $\frac{V^2}{R}$. Thus the power at the peak of the modulation envelope is multiplied by four, and hence the permitted power level is 4 × 100W, or 400W p.e.p.

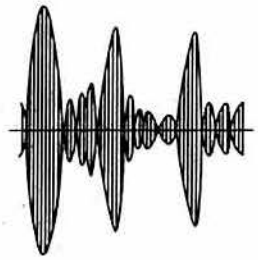


Fig 3. Waveform of an ssb transmission

The usual way of measuring p.e.p. is shown in Fig 4. The transmitter is modulated by a two-tone generator containing two af oscillators producing non-harmonically related sinusoidal tones of equal amplitude which are combined. The output of the transmitter is dissipated in a dummy load and observed on an oscilloscope. The output power of the transmitter may be found by measuring the rf voltage across the dummy load on the oscilloscope (or by an electronic voltmeter) and calculating it from $W = V^2/R$. Alternatively it may be calculated from $W = I^2R$, where I is the rf current in the load measured by an rf ammeter (2–3A max) if available.

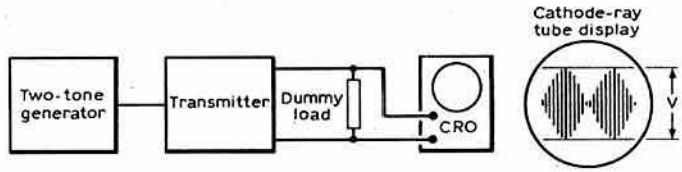


Fig 4. Measurement of peak envelope power

The transmitter is adjusted to produce an output of 200W, measured as above. This power will give rise to a certain deflection on the oscilloscope, and the limits of this deflection can be marked on the tube face or graticule by two thin lines drawn with a chinagraph pencil. It can be shown that the power level of 200W to which the transmitter has been adjusted (with two-tone input) is equivalent to a p.e.p. of twice that value, ie 400W p.e.p.. When the two-tone generator is replaced by a microphone, the peaks of the speech waveform must not be allowed to exceed the limits defined by the two lines on the oscilloscope (Fig 5). It is convenient to set up at this power level, as it leads directly to an indication on the oscilloscope of the maximum power permitted by the UK licence.

If the transmitter is not capable of operating at full power, a lower power can of course be used and the resulting deflection scaled up to represent

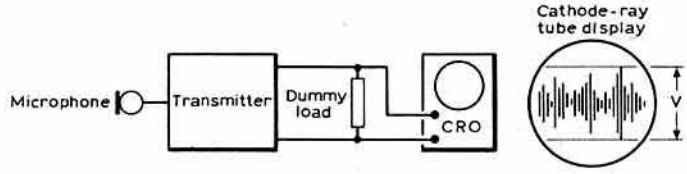


Fig 5. Peaks of speech shall not exceed level determined in two-tone test (Fig 4)

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400W p.e.p.. Alternatively the power corresponding to a particular deflection can be calculated. In scaling up or down, it must be remembered that the deflection of the oscilloscope beam is proportional to the voltage which caused it; but power is proportional to V^2, hence the power is proportional to the square of the deflection. For example, if the deflection corresponding to 400W p.e.p. is 5cm, and the deflection caused by speech peaks is 2.5cm, then the power corresponding to a deflection of 2·5cm is:

$$400 \times \frac{2 \cdot 5^2}{5^2} = 400 \times (\frac{2 \cdot 5^2}{5})^2 = 400 \times (\frac{1}{2})^2 = 100\text{W}$$

Questions and answers

A number of queries inevitably arise now, for example:

Q. A bit complicated, isn't it?

A. Yes! but it does get around the impossibility of determining the power input by trying to measure a rapidly varying current on a conventional meter.

Q. Why do I need a two-tone generator?

A. A single tone could be used. The ssb transmitter would then convert this to a single radio frequency (in effect, this would be a carrier wave). We would then have to set the output power to 400W and not 200W as in the two-tone case.

It is now that one has the paradoxical situation that when an ssb transmitter is transmitting a single tone, the p.e.p. output is equal to the rms (ie real) power output. In many ways, the term "maximum envelope power" would be preferable to "peak envelope power". It is essential, of course, to confirm that the transmitter is capable of operating at this level.

As a matter of interest, a three-(or more)-tone signal could be used, and the transmitter would then be set up to 400/3 or 133W (in the three-tone case). The two-tone source is generally used for reasons of simplicity. Any distortion of the transmitter output waveform when two-tone input is used is indicative of maladjustment or incorrect operation such as excessive drive, incorrect bias or loading on the pa or possibly excess carrier.

Q. Do I really have to do all this?

A. Most of the linear amplifiers available in the UK are capable of an output of more than 400W p.e.p.. Anyone using one of these may well be asked by a Post Office inspector to demonstrate that the licensed power is not being exceeded. Most transceivers have an output of 150W p.e.p. or less, so the question cannot arise. However, do not forget that one really should have a dummy load for tuning up, and also that the only effective way of checking the operation of an ssb transmitter is by an oscilloscope.

Q. Can I use a wattmeter to measure the power?

A. There appears to be no reason why a wattmeter of reputable make, incorporated in an antenna matching unit or used separately, should not be used. However, it may be difficult to persuade a Post Office inspector that a scruffy-looking home-made wattmeter has adequate accuracy.

Some wattmeters read p.e.p. direct by means of a long time-constant circuit to "add up" the peaks of the waveform over a period of several seconds. Thus a constant reading is obtained. Unless wattmeters are calibrated by the method discussed earlier, one has to assume that their accuracy is adequate. However, at the price now being charged for such meters, it is not unreasonable to expect documentary evidence of accuracy.

It should be noted that ssb transmitters and linear amplifiers are normally rated in terms of p.e.p. "input", eg a transceiver using two 6146 valves in the output stage is rated at an input of 200W p.e.p., and will give an output of 90–100W. These ratings are determined by the valve maker in his laboratory, the output corresponds to the efficiency to be expected from a Class AB stage.

Conclusion

It is hoped that the above will help the reader to understand the measurement of peak envelope power as required by the UK amateur licence. The theoretical background will be found in *Radio Communication Handbook*, 5th edn, pp 6.98–6.104.

This article started as a joint effort between the author and his old friend and ex-colleague, the late Alan Bayliss, G8PD/PA0AAR. It arose out of discussions and correspondence concerned with the preparation of the eighth edition of the *Radio Amateurs' Examination Manual.* □

Automatic transceiver break-in for a car

by LORIN KNIGHT, MIEE, G2DXK*

LIKE MANY OTHER READERS of *Rad Com*, the author has in his car both a normal broadcast-band receiver and a 144MHz transceiver. During a journey his interests may alternate between the two and, in order to simplify the change-over operation, he has built an automatic switching unit.

At the heart of this unit is a relay which switches the loudspeaker from the broadcast receiver to the transceiver. The relay remains unenergized so long as the transceiver is not in use, but is energized whenever the transceiver is switched to TRANSMIT or is receiving signals.

Basic operation

The circuit is shown in Fig 1. Any af output from the transceiver is fed via the transformer T1 to TR1, causing that transistor to conduct on peaks and charge-up the 22μF capacitor. This causes the Darlington pair, TR2 and TR3, to conduct and energize the relay RLA which switches the loudspeaker. When the transceiver is switched to TRANSMIT a second relay, RLB, is energized. This biases TR1 into conduction, producing the same result.

RLB has its coil in series with the 12V supply to the transceiver and is operated by the increased current which is drawn on TRANSMIT—in the author's case a change from around 150mA to around 2A. The relay was made by winding 40 turns of 36swg enamelled wire around a small reed switch, using a short length of plastic drinking straw for a bobbin. The relay operates with a current of about 1A. The 22μF capacitor provides a delay, holding RLA energized for one or two seconds after TR1 has ceased conducting.

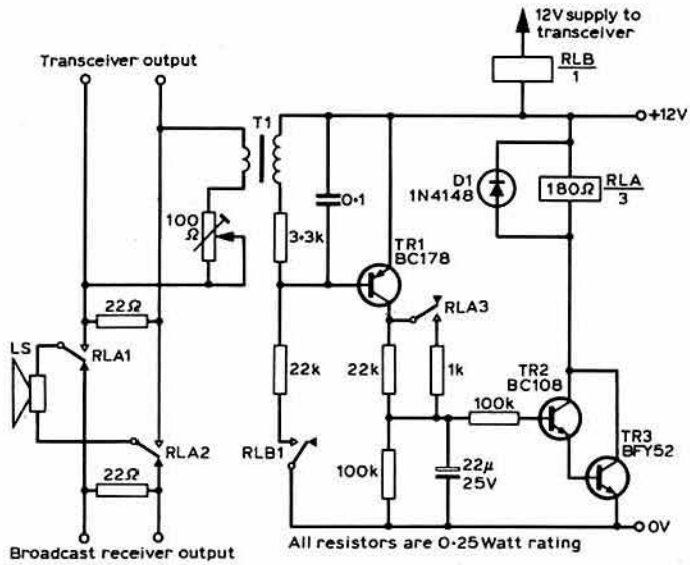

Fig 1. Circuit diagram of the switching unit

Tailoring the switching characteristics

Ideally one does not want the broadcast receiver to be muted by unwanted outputs from the transceiver such as:

(a) random clicks or bursts of interference;

(b) isolated syllables of speech from a weak signal which is only occasionally breaking the squelch; and

(Continued on page 495)

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A computer program for QRA locators and contest scoring

by DAVID W. HUGHES, CEng, MIMechE, GI4JNS/EI9DW*

ONE OF THE most laborious tasks for vhf contest entrants is that of determining the distance to each station worked, and the resulting score. Having performed this task on several occasions for the local club, and having been elected contest manager as dubious reward for his efforts (no doubt to repeat the task again for future contests!), the author decided to write a computer program to do it for him. The program is given in Table 1.

The QRA locator system uses an alphanumeric code to define any location in Europe. This code consists of five characters: two letters, two figures and another letter. The first letter indicates the longitude, and the second letter the latitude of the main "square", which is two degrees of longitude by one degree of latitude. Each main square is divided into 80 sub-squares, numbered 01 to 80 (the two figures of the code). Then each sub-square is further divided into nine sub-sub-squares, lettered a to j (i is not used). For example, WP67j is the QRA locator of the author's station. The "origin" of the system (ie the southwest corner of AA square) is 40°N, 0°E.

Reference to a complete QRA locator map will show that some codes are not unique. For instance, PX square could be either in Iceland or Turkey. However, this ambiguity is unlikely to be a nuisance to most vhf/uhf operators, as the distance between similarly-lettered squares is generally several thousand kilometres!

The computer program simply converts QRA locator codes into longitude and latitude, and thence to spherical co-ordinates. (The assumption that the earth is spherical is thought to be reasonable for this purpose!) The great circle distance on the earth's surface between two points, as given by the QRA codes, is then calculated by simple trigonometry.

The program is written in Basic, and is suitable for most microcomputers as well as larger machines—and is described below. It begins by requesting the QRA of the base station, and stores the corresponding spherical co-ordinates for the duration of the program run. The QRA locators of the contacts are then entered, one at a time, and the distance to each station and the resulting contest score are displayed by the computer. A sample output is shown in Table 2.

The program includes simple checks on the validity of the entered codes; for example, AB12x would not be accepted (x is not a valid sub-sub-square letter), nor would WP83a (there are only 80 sub-squares).

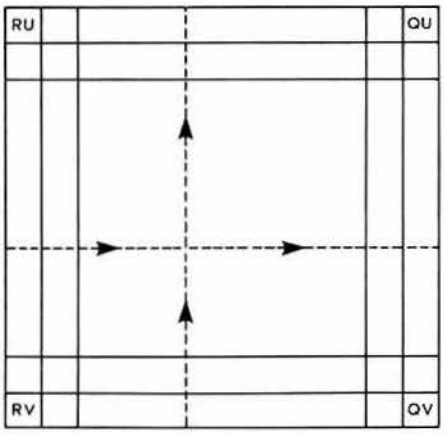

Fig 1. Program boundaries

* 4 Ballyreagh Road, Portrush, Co Antrim BT56 8LP.

Table 1. Program listing

```
10 R=6371.02
20 PRINT
30 PRINT
40 PRINT "  ### QRA LOCATOR PROGRAM ###"
50 PRINT
60 PRINT
70 INPUT "QRA OF OWN STATION ";Z$
80 GOSUB 1000
90 IF K=1 GOTO 70
100 X0=X
110 Y0=Y
120 Z0=Z
130 PRINT
140 PRINT
150 INPUT "QRA OF CONTACT ";Z$
155 IF Z$="/" THEN STOP
160 GOSUB 1000
170 IF K=1 THEN GOTO 150
180 DX=X-X0
190 DY=Y-Y0
200 DZ=Z-Z0
210 Q=SQR(DX*DX+DY*DY+DZ*DZ)
220 Q=Q/(2.0*R)
230 KM=2.0*R*ATN(Q/SQR(1-Q*Q))
240 KM=INT(KM+0.5)
250 SC=INT(KM/50)
260 SC=SC*2+1
265 PRINT
266 PRINT
270 PRINT Z$,KM;"KM",SC;"POINTS"
280 GOTO 130
1000 K=0
1010 A=ASC(MID$(Z$,1,1))-65
1020 B=ASC(MID$(Z$,2,1))-65
1030 I=ASC(MID$(Z$,3,1))-48
1040 J=ASC(MID$(Z$,4,1))-48
1050 C=ASC(MID$(Z$,5,1))-65
1060 IF A<0 OR A>26 GOTO 1500
1070 IF B<0 OR B>26 GOTO 1500
1080 IF C<0 OR C>9 OR C=8 THEN GOTO 1500
1090 IF I<0 OR I>8 THEN GOTO 1500
1100 IF J<0 OR J>9 THEN GOTO 1500
1105 IF I=8 AND J>0 THEN GOTO 1500
1110 IF A>17 THEN A=A-26
1120 LO=A*2
1130 IF B>21 THEN B=B-26
1140 LA=B+40
1150 II=I
1160 JJ=J
1170 IF J<>0 THEN 1200
1180 II=II-1
1190 JJ=10
1200 LO=LO-0.1+(0.2*JJ)
1210 LA=LA+0.9375-(0.125*II)
1220 IF C=7 OR C=6 OR C=5 THEN DO=0.03333
1230 IF C=0 OR C=9 OR C=4 THEN DO=0.1
1240 IF C=1 OR C=2 OR C=3 THEN DO=0.16667
1250 LO=LO+DO
1260 IF C=5 OR C=4 OR C=3 THEN DA=0.02083
1270 IF C=6 OR C=9 OR C=2 THEN DA=0.0625
1280 IF C=7 OR C=0 OR C=1 THEN DA=0.10417
1290 LA=LA+DA
1300 LO=LO*3.1415926/180.0
1310 LA=LA*3.1415926/180.0
1320 SN=SIN(LO)
1330 SA=SIN(LA)
1340 CO=COS(LO)
1350 CA=COS(LA)
1360 X=R*CO*CA
1370 Y=R*SN*CA
1380 Z=R*SA
1390 RETURN
1500 K=1
1510 PRINT " *** ERROR *** INVALID QRA CODE"
1520 RETURN
```

Table 2. Sample output

```
### QRA LOCATOR PROGRAM ###

QRA OF OWN STATION ? WP67J

QRA OF CONTACT ? WO34D

WO34D           82 KM          3 POINTS

QRA OF CONTACT ? YM53F

YM53F           384 KM         15 POINTS

QRA OF CONTACT ? ZK54E

ZK54E           656 KM         27 POINTS

QRA OF CONTACT ? WP83D
 *** ERROR *** INVALID QRA CODE
QRA OF CONTACT ? WP8ØD

WP8ØD           46 KM          1 POINTS

QRA OF CONTACT ? BD19K
 *** ERROR *** INVALID QRA CODE
QRA OF CONTACT ? BD19J

BD19J           1467 KM        59 POINTS

QRA OF CONTACT ? /
Stop
```

Description of QRA locator program

Basic is a particularly useful language for character manipulation, and this advantage has been put to use in this program. The alphanumeric QRA locator code is read as a five character text variable (Z$). A subroutine (beginning at line 1000) is then used to decode this variable into spherical co-ordinates. The variable Z$ is split up into five separate variables (representing the individual letters and figures) using the MID$ function. Each of these variables is converted into its numerical ASCII value, using the ASC function, and adjusted so that, for letters, "A" = 0, "B" = 1 etc, and for figures, "0" = 0, "1" = 1 etc (lines 1010 to 1050). Each character of the QRA code is now represented by an integer variable (A, B, I, J, C respectively), and it is relatively simple to convert the code into longitude and latitude. This is performed in lines 1060 to 1290 (LO = degrees longitude, LA = degrees latitude). The program as presented operates between the boundaries indicated in Fig 1. These boundaries may, however, be changed by alteration of lines 1110 and 1130 of the program. The remainder of the subroutine converts the longitude and latitude co-ordinates into spherical co-ordinates X, Y, Z.

X = R. Cos (long). Cos (lat)
Y = R. Sin (long). Cos (lat)
Z = R. Sin (lat)

where R is the mean radius of the earth in kilometres, and "long" and "lat" are the longitude and latitude co-ordinates respectively.

Returning to the main part of the program, the chordal distance between two points is then calculated:

$$\text{chord} = \sqrt{(X - X_O)^2 + (Y - Y_O)^2 + (Z - Z_O)^2}$$

where (X, Y, Z) and (X_O, Y_O, Z_O) are the spherical co-ordinates of the two points.

The great circle distance is then given by:

$$\text{distance} = 2R.\ \text{Sin}^{-1}\left(\frac{\text{chord}}{2R}\right)$$

Note that, in Basic, there is usually no function for Sin^{-1}, therefore the coding is rearranged to use the Tan^{-1} function (ATN).

The score is then calculated, using the usual 50km radial ring scheme, and the results are written out.

Conclusion

As an indication of the usefulness of the program, the 125 contacts made by the North West ARC in the March 1981 144/432MHz Contest were processed in about 10min using the computer. Previous contests had required a lengthy evening's work with a large QRA map, ruler, pencil, rubber, pocket calculator and a fair amount of patience. As many readers will realize, this was a comparatively small number of contacts for a contest (well, we were in WP square after all!), and contest enthusiasts whose callsigns regularly appear at the upper end of the results table, and who do not already use a computer for scoring, will perhaps appreciate this computer program.

Finally, do not expect the computer to tell you when the QRA locator apparently places your dx contact in the middle of the North Sea! □

AUTOMATIC TRANSCEIVER BREAK-IN FOR A CAR

(Continued from page 493)

Components list

T1	Tandy 273-1380 or any similar transistor output transformer
TR1	BC178 or similar pnp
TR2	BC108 or similar npn
TR3	BFY52 or similar npn
D1	1N4148 or similar
RLA	4-pole 12V subminiature relay, Maplin Electronic Supplies (coil resistance 185Ω, contact rating 2·5A ac)
RLB	See text

All resistors are 0·25W

(c) The background hiss and/or the morse identification signals from a repeater which is not transmitting any speech.

These requirements have been achieved with a fair degree of success by the following measures:

(a) a fairly high value (22kΩ) for the TR1 collector resistor, which produces a delay of around two syllables before the charge on the 22μF capacitor reaches the threshold required to operate RLA;

(b) the 0·1μF capacitor between base and emitter of TR1, which reduces the sensitivity to the higher audio frequencies; and

(c) the 100Ω preset resistor which allows the sensitivity to be adjusted to the optimum point.

There was one snag initially. If the speech being received contained appreciable pauses, or if the signal became choppy, the charge on the 22μF capacitor tended to hover around the threshold value—with the result that RLA kept switching on and off with rather disconcerting results. This problem was overcome by utilizing a spare set of contacts, RLA3, to shunt 1kΩ across the TR1 collector resistor once RLA was energized. Now, once a signal has succeeded in operating RLA, that relay stays energized even if the signal becomes quite choppy.

The 22Ω resistors were added to eliminate clicks when the loudspeaker was switched. They may not always be necessary, depending on the particular output circuits of the equipment used.

Construction and operation

The switching unit is mounted on a piece of Veroboard and enclosed in a small diecast box, to which all connections are made via two six-way moulded terminal blocks mounted on it.

In use, the unit has been found to function very satisfactorily. One can drive along listening to, say, Radio 2 while the transceiver is monitoring S20 or a repeater channel. The transceiver will then break in if it picks up a reasonable signal. If no signal comes through and one is tired of listening to the disc jockey, one can silence him by giving out a CQ call!

Even with the broadcast receiver switched off, the device plays a useful role. It will switch out many of the extraneous noises that one does not really want to hear—including that anonymous heavy breathing which occasionally plagues certain repeaters! □

TECHNICAL TOPICS

Pat Hawker, G3VA

IF THIS MONTH *TT* seems a little more than usually American-orientated, it is not that I always regard the USA as the birthplace of modern amateur radio—indeed it is claimed that the first non-professional experimental station was established in Dublin in 1898—but because I have been hard pressed to catch up with copy dates following an all-too-brief but very interesting trip to Dallas and New York City—"Big D" and "Big Apple".

The heart of Texas

Quite by chance, I found myself in a milling throng of American amateurs in a large "flea market" on waste ground near to a well-stocked amateur radio store, Electronic Center Inc, just off one of the main expressways leading into Dallas. Many of the amateurs had brought in equipment for sale, while for others this was clearly a trading enterprise. I found out that this large flea-market is held regularly, on the first Saturday morning of each month, and attracts large numbers of enthusiasts from considerable distances. The firm, far from seeing the market as a rival, clearly encourages and helps it on the grounds that it brings many amateurs looking also for new equipment.

American secondhand prices compared favourably with those of the UK, although with some fairly wide variations. It has long been a truism that for much electronic equipment (not only Japanese transceivers) the exchange rate is not far off one dollar per pound. In the USA, hf is still "king" although (as here) a lot of amateurs are using handheld vhf units in conjuntion with local repeaters. Some of the prices I noted for reasonably good quality secondhand items included: Century 21, $200; Omni, $500; Tempo One, $375; a high-quality Collins professional receiver, $400; a KWM2A, $800; a 75A4 receiver, $450 (or with an old Collins 32V2 transmitter thrown in, $500); a collector's 1930s Meissner Signal Shifter (shabby), for just $10.

Compared with previous visits to the National Association of Broadcasters Convention/Exhibition (NAB) in 1975 and 1976, it was very noticeable how the heat seems to have gone out of the American cb scene. Although handheld very-low-cost units (49MHz) can still be seen in the stores, along with the occasional 27MHz mobile/base unit, there is, as far as I could judge, very little general press advertising of cb equipment in the way one saw in the mid-'seventies. The number of cb licences has also fallen quite dramatically, although it should be remembered that in the USA no licences are required for the smallest handheld units. The cb industry clearly lost a great deal of momentum when the system was suddenly changed to 40 channels and a large number of 23-channel equipments had to be unloaded on the market at heavily discounted prices. In numbers, cb operators are still apparently thick on the ground, but evidently the "boom" of 1975-6 has now long passed its peak.

The present trend seems to be more towards low-cost home and office computer systems with Radio Shack (Tandy) noted to have stores both in downtown Dallas and central New York. A Heath store at Dallas was also found to have only a small section devoted to amateur radio equipment, concentrating on other hobby electronics and home computers. I saw quite a few American amateur-radio publications on sale, but failed to find a single British publication, although RSGB books are now sold in the USA by ARRL. At NAB there was a special evening reception for radio amateurs (many of whom work in the American broadcast industry). Several hundred were present, from most continents, but it was rather cut short by the need to catch the convention buses.

Also seen in Dallas was a fascinating private "Texas Broadcast Museum" with a really fine collection of early radios and acoustic gramophones and a couple of 'thirties broadcast transmitters. A corner is devoted to amateur radio. Names such as Atwater Kent, Paragon, Grebe, Radiola, Silvertone, Admiral and the Philco "Cathedral" design are there alongside some early Hallicrafters (including 'forties Hallicrafters tv receivers), a directory of American amateur stations of 1931, copies of early ARRL *Handbooks*, the long-defunct R9 magazine and a description of amateur radio at the Chicago World's Fair of 1933. Together with 78s recordings and tapes of early radio shows. A very nostalgic half-hour!

Cable threat

Last year (*TT*, October 1981, p930, and December 1981, p1128) attention was drawn to the serious interference problems—both tvi and interference to amateur radio reception—posed by the rapid growth of cable systems in the USA. This was coupled with the warning that similar problems, affecting in particular the 144MHz band, may arise in the UK in the fairly near future. Since then there has been a report of the Government's Information Technology Advisory Panel, reflecting strongly the views of the cable operators and the manufacturing industry, though not of the broadcasters. This recommends a rapid extension of wideband systems in the UK, with the minimum of regulatory safeguards. There have also been further strongly-worded editorials and articles on this subject in *QST* and *Ham Radio* underlining the significance to amateurs of cable distribution at frequencies within the American 144MHz band (144-148MHz) and the American 50 and 220MHz bands, particularly in view of the proposed FCC rule-making that will relax the "leakage" regulations from 20μV/m to 100μV/m at 10ft. *Ham Radio* suggests that the result could even be the outlawing of American 144MHz operation and asks "how many more attempts will industry make to muscle in on amateur radio frequencies?".

As I saw in Dallas, the cabling up of American cities is continuing at a fast rate (though not as fast as promised by some cable operators when seeking franchises from the local authorities). Cable systems tend to use economical (and hence often most "leaky") cable and connectors, and there are also problems arising from inadequate maintenance. When such a cable using 144MHz distribution for one channel passes close to an antenna there seems to be just no way in which the amateur can avoid causing interference, and vice versa.

There is also the question of the many (more-or-less legal in the USA, illegal in the UK) cordless telephones that provide short-distance links on 1·6 to 2·0MHz. Again American industry is trying to "liberalize" the FCC regulations in respect of these devices. In the UK, British Telecom is reported to be developing approved cordless telephones operating at about 900MHz—but a shop within a few hundred yards from me has 1·9MHz units openly on sale.

One should also note the many 49MHz handheld "cb" units on sale in the UK (illegal) and the USA (legal), establishing yet another bridgehead that may embarrass the attempts to obtain a 50MHz amateur frequency as the 405-line Band I tv stations close down (1982-6). As already noted, it was interesting to see the very marked slackening of the sales effort directed at the cb market when compared with earlier visits in 1975 and 1976. Then the press was full of adverts for 23-channel cb—but the bubble has now long burst.

455kHz crystal oscillator

One thing in common between the lavish displays of "surplus" components at the "Big D" fleamarket and Alexandra Palace was the scarcity of the old-style war-surplus crystals for frequencies within, or easily related to, the amateur bands. One London trader is said to have disposed of his entire stock of tens of thousands of old crystals to a West German firm—they certainly seem to have vanished from London when compared to just a few years ago. At AP one could still rummage through a few boxes of small HC6 metal-cased crystals at 10p a time, but I hope others were more successful than I at finding what they needed. In my case the requirement arose from a wish to try out a miniature crystal-controlled transmitter without running into the difficulty that my few remaining in-band pieces of quartz all tend to be in rtty-smothered sections of the bands.

There are still some useful 455 and 465kHz crystals around, suitable for use either in ssb or cw filters, or to make a stable bfo. In this connection, Ed Marriner, W6XM, in *Ham Radio* (March 1982, pp66-7) notes that it is not

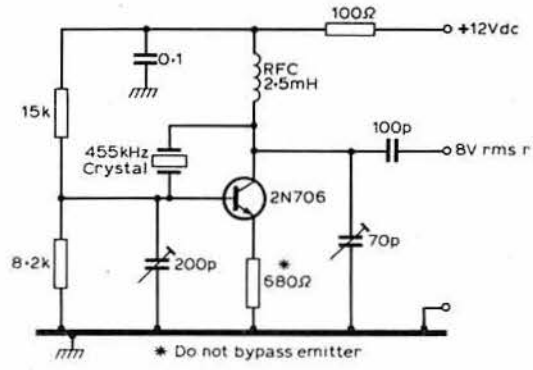

Fig 1. 455kHz crystal oscillator circuit used by W6XM

always easy to find a practical, sure-fire circuit for a low-frequency transistor oscillator. He has adapted some earlier published suggestions and comes up with the circuit arrangement shown in Fig 1. He comments: "The circuit needs a little explanation. Most crystal oscillator circuits show a bypass capacitor between emitter and ground. I could not make such a circuit oscillate, and it was also necessary to include the 2·5mH rf choke. Then I found, when using two variable capacitors, that the capacitance from base to ground needed to be greater than usually indicated. Juggling the two capacitors gave maximum output (about 8V rms). My transistor was a 2N706, but other npn types should work (eg 2N2222). The crystal was an HC6 type. I was unable to achieve any results using MPF102 fet devices although many published circuits favour them. I also tried using a trimming capacitance in series with the crystal but at this frequency this had little or no effect. My arrangement makes a very useful bfo."

Strong signal performance

In *cq-DL* 11/81, Guenter Schwarzbeck, DL1BU, provides a detailed and thorough discussion of the large signal performance problems that can still be found in many current hf receivers, although my grasp of the German text is decidedly hazy. Nevertheless his excellent tabular material (Table 1) gives, among other characteristics, the intermodulation-free dynamic range of receivers measured on or near the main broadcast bands. DL1BU shows that, even from a trapped dipole (W3DZZ), signals from broadcast transmitters can be as high as 100mV, leading to receiver-made interference signals as a result of non-linearity in the front-end. It should be noted that "intermodulation-free dynamic range" as used in this context is significantly less than the difference between the various intercept points (which vary according to the measurement technique) and the minimum detectable signal level (mds) or noise floor. It should be appreciated that the actual range of intermodulation-free signal levels that can be handled by a receiver can be changed by using a front-end attenuator, but the dynamic range itself is not changed appreciably; nevertheless intelligent use of an attenuator can greatly reduce harmful generation of spurii.

Table 1. Characteristics of current hf receivers compiled by DL1BU. (Measurements made close to 7MHz)

	Dynamic range (intermodulation-free with test signals spaced 20kHz) in decibels	Noise floor (mds) relative to 1dBm
Astro 102BX	80	−123·5
Astro 150	80	−123
Collins KWM80	98	−124
Datong PC-1 (converter)	72	−113
Drake R4C (old)	81·5	−137
Drake R4C (valve model)	80	−133
Drake TR7	98	−127
Icom 701	80	−125
Icom IC720A	97	−135
Icom IC720A with attenuator	98	−112
Trio (Kenwood) TS120S	82·5	−134
Trio (Kenwood) TS180S	69	−134
Trio (Kenwood) TS820S	85	−134
Signal One CX11A	99	−124
Ten Tec Omni D	86	−124
Yaesu FT101ZD	82	−135
Yaesu FT107M (old)	85	−129
Yaesu FT107 (WARC bands)	84	−131
Yaesu FT707	85	−133
Yaesu FT902D	80	−130

In reproducing a selection of the results tabulated by DL1BU, relating to current and recent hf receivers and/or transceivers, it is necessary to stress once again that important though a good dynamic range can be, particularly on 7MHz where weak amateur signals are mixed up with or close to the powerful broadcasters, it would be misleading to suggest that any one receiver characteristic should be regarded as providing an overall "figure of merit". Nevertheless his results do show that there are still quite wide variations to be found between different models. In general terms, it could be argued that some designers still have a tendency to make receivers more sensitive than is really necessary (ie very low noise floor) and that it is these receivers that tend to have a rather restricted strong signal performance. It is also clear that receivers using doubly-balanced diode mixers tend to provide an appreciably greater intermodulation-free dynamic range than those using dual-gate mosfet mixers.

Transmitter techniques

The enormous NAB exhibition is concerned entirely with radio and television broadcasting rather than communications. Nevertheless there were a few items of equipment that have some bearing on current trends in transmitter design. For example, the latest range of medium-wave (a.m.) transmitters by the large Harris Corporation include all-solidstate equipments up to a rating of 5kW output (SX1 1kW, SX2·5 2·5kW, and SX5 5kW). An outline of the SX5 is shown in Fig 2.

Unlike most previous all-solidstate broadcast transmitters, these use power mosfets for power amplification rather than bipolar transistors. In fact mosfets are used both in the power amplifier and in the modulator section. The pa design in all three transmitters is based on a common module, capable of delivering about 1·375kW rf carrier output; this module uses 16 mosfets arranged in groups of four devices, each group forming a "balanced quad" circuit. Each of the four devices delivers its power to the primary of a toroidal transformer, and the secondaries of these transformers are connected in series (which in turn are in series with any further 1kW modules). Each module has a 240V supply and the pa stage operates in Class D (switching mode) achieving an efficiency of better than 90 per cent. The a.m. modulation uses the pulse duration technique (pdm) introduced by the company for earlier a.m. solidstate transmitters but now further developed in a polyphase form. It should be appreciated that mosfet power devices still

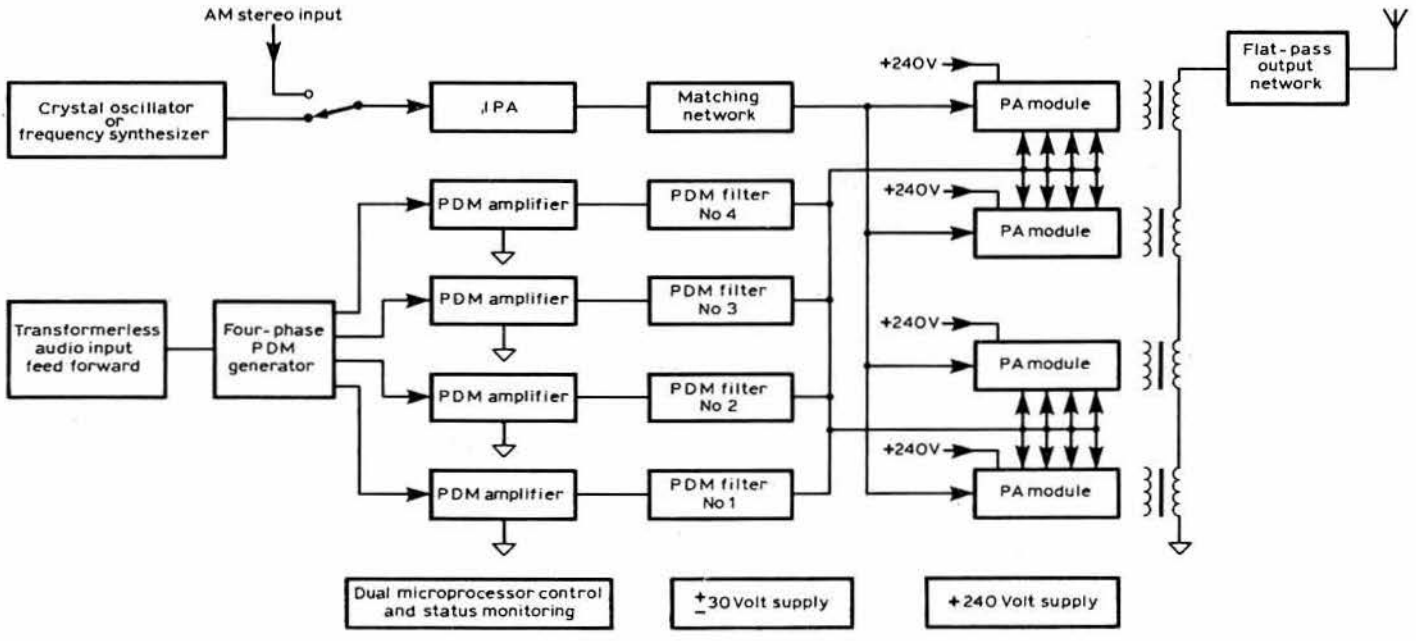

Fig 2. Block diagram of the new Harris SX-5 5kW all-solidstate medium-wave broadcast transmitter in which the power stages are based on mosfet modules

tend to be limited in maximum frequency to under about 10MHz. The Harris equipments are for the medium-wave band.

With the rising cost of electricity, one of the major design objectives in high-power transmitters that are intended to operate over many hours each day is to achieve the highest possible overall efficiency; in other words to provide the maximum rf watts out from the minimum electricity-supply watts consumed. American broadcasters pay about 6 to 10 cents/kWh, and high overall efficiency is even more important for uhf television transmitters than for sound radio. In the early days of uhf television the power klystrons had a relatively low conversion efficiency. Even today, despite many improvements, there is still a very active search for new techniques to increase overall conversion efficiency.

Use and abuse of valves

The smaller, very cost-conscious American radio stations are also concerned at the increasing cost of replacing high-power rf valves, as these may be required to be on for the full 8,736 hours in the year, with quite a few stations running a 24h schedule (on the other hand the Americans have quite a few daytime-only medium-wave stations in order to keep down night-time interference). The makers of power valves admit that they are having to charge higher prices not only because of the general inflationary cost spiral but also because of the volatile cost of precious metals generally, combined with the uncertain supply of some of the more exotic metals used in high-power valves.

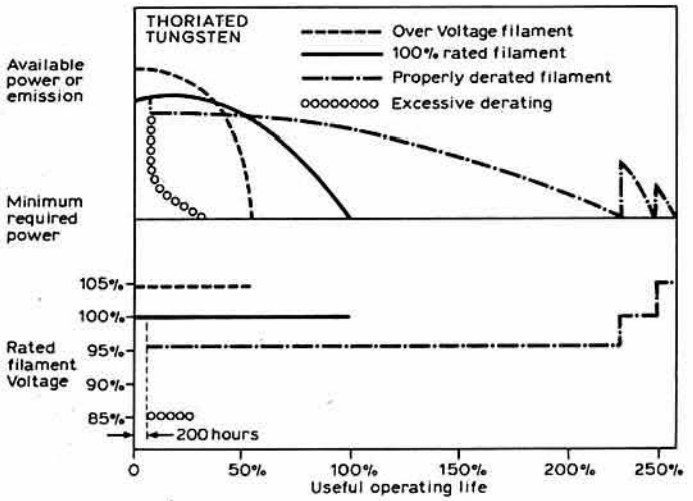

Fig 3. Showing the effect of good filament voltage management on high-power and medium-power directly-heated rf valves having thoriated tungsten filaments. Life can be more than doubled by very careful derating and control of the filament voltage

An article by Robert Artigo of Varian Eimac in *BME* (formerly *Broadcast Management Engineering*) (March 1982) shows that with thoriated tungsten filaments (used in high-power directly heated valves) a very significant extension of average valve life can be achieved by careful regulation and management of the filament voltage, provided that the peak emission is also derated to some small extent. On the other hand excessively low filament voltage can very quickly cause loss of emission and dramatic fall of output power: Fig 3. The author stresses that if the filament voltage cannot be regulated to within ±3 per cent, the filament should always be run at its nominal rated voltage. On the other hand, with good regulation, it becomes possible to deliberately run the filament at some five per cent below nominal rated voltage until almost the end of its useful life, and in this way it is possible to more than double valve life.

It is not always possible for the amateur, with only limited valve data available, to be sure whether his valves use thoriated tungsten filaments, though these are still quite widely used in both medium- and high-power directly-heated valves; almost certainly this approach is used in the 50W filament of the still popular 813, and I suspect this is also the case with modern linear amplifier valves such as the 3-500Z, 8877 etc. With the more common oxide-coated cathodes, in such valve types as the 4CX250B, it is important to maintain the heater voltage to within ±5 per cent of nominal, and such voltage must be measured *directly at the valve socket* with the valve in place.

In these days when so many newcomers have only limited experience of using thermionic devices, many of the carefully garnered ideas of a few decades ago tend to be forgotten. It was then recognized that thoriated tungsten filaments can quickly lose emission when the valve is operated appreciably above its rated filament voltage, and it was customary to specify a five per cent tolerance rather than the ±10 per cent for indirectly heated cathode-type valves. When such a valve loses emission due to a temporary or accidental overvoltage, it is often possible to restore emission by running the filament for a short period (about 10min) at the rated value with all other voltages removed, or for a few minutes at about 20 per cent above nominal. Indeed in a 1948 RSGB publication *Valve Technique* by the late D. N. Corfield, G5CD, it was even suggested that it is sometimes possible to re-activate a thoriated tungsten filament by "flashing" at about 2·5 times normal voltage for 1min. This reduces the unwanted layer of thoria to thorium and should be followed by a 15 to 30min run at about 1·5 times normal filament voltage, to give the new thorium a chance to diffuse to the surface. However, should there be no thoria left to reduce, such treatment will "flash-off" the existing thorium with no means of replacing it, and the valve will then be a definite "write-off".

Basically similar "flashing" treatment can also be applied to valves with oxide-coated cathodes. In this case, the technique is more likely to be effective with valves that have failed prematurely due to surface poisoning. On the other hand, if the valve has already had a long life and the failing is due to loss of barium rather than surface poisoning, the flashing treatment is likely to hasten its decline.

In general, running at excessively high temperature due to lack of good ventilation is a fairly sure method of reducing the useful life of a valve. It was well recognized that one of the most lethal devices ever produced was the standard aluminium shield used with so many miniature valves. Special dark shields or no shields at all increased life expectancy, and finned valve heatsinks or heat exchangers can also be very effective in some circumstances.

Another important factor is to avoid damage due to reversed or negative grid current, and the usual recommendations are: not to use excessive filament voltage; not to permit excessive dissipation; and to limit the total dc resistance of the grid-cathode path to a safe value.

Versatile voltage regulator

A low-cost voltage regulator arrangement that provides short-circuit protection and has low drop-out (ie it will work with as little as 0·5V input/output differential) has been described by Walter Joswick in *Electronic Design* (4 March 1982, p125).

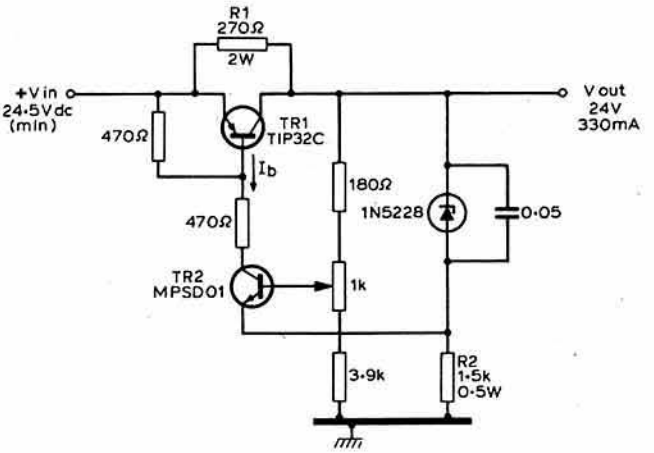

Fig 4. A voltage regulator which includes short-circuit protection and low drop-out. Component tolerances are not critical and low-cost components are used

He shows that since the output node is placed in the bias loop, through R1, a short-circuit or severe overload will reduce the bias applied to TR1 and so prevent its conduction. R1 also initiates the regulator; it allows sufficient current to the load to develop an output voltage equal to the short-circuit output voltage during a cold start, even at minimum input voltage. At maximum input voltage, including power surges, the regulator does not conduct more than the load current. TR2 compares the output voltage against a voltage equal to the output minus the zener voltage. Transient response is said to be limited only by circuit parasitics and the quality of the active devices. As shown in Fig 4, the suggested circuit provides 24V at up to 330mA from an input that can be as low as 24·5V. The basic idea could probably be adapted to meet other supply requirements.

Vintage receivers still viable?

In the March *TT* I referred to a note received from Arthur Rumbelow, G3KKC, stressing that the relatively "ancient" G2DAF Mk2 hf receiver still sets a standard of performance that few modern solidstate receivers or transceivers can equal, let alone surpass. However, I added the cautionary note that for a beginner without a well-stocked junk box it is no longer a simple (or cheap) matter to obtain all of the components originally specified for the separate G2DAF receiver/transmitter designs.

This has stirred G3KKC to pen a further letter in which he stresses that with patience and attendance at exhibitions, mobile rallies and flea markets it *is* still possible to assemble even the more-difficult-to-come-by (from original suppliers) components at reasonable cost. He writes:

"It has been my experience over the past year, while looking around various amateur radio exhibitions etc, that components for the G2DAF Mk2 receiver *are* still readily available. For example: specified variable capacitors at £1 each brand new; specified coil formers with cans and dustcores at around 5p each (secondhand); and vfo coil formers about 30p (and also available new from Cambion). Eddystone 898 dials are more difficult to locate, but I have seen new ones offered at £12.10. The conversion crystals are available from new sources, as are the chassis.

"It is my opinion that, *even now,* this receiver is a viable, economic proposition for the kitchen-table constructor—and it forms an excellent 'comparison test bed' against which to evaluate and judge solidstate receivers. Additionally the design can be partially transistorized—for example, the vfo and af stages—and digital tuning display could possibly be added *if* required."

Sunspot cycles yet to come

Professor Martin Harrison, G3USF, whose interest in propagation and the ionosphere will be well known to most *TT* readers, has come across an interesting couple of papers in scientific journals that attempt to throw a little more light on the variations between the different sunspot cycles, and to make at least some tentative predictions as to the likely pattern over the next couple of decades. Before commenting on these, it may also be relevant to note that since those papers were written there is some evidence, from satellite observations, that there has recently been a steady drop in the total output of energy from the sun, possibly sufficient to have a long-term effect on the climate. In fact it could herald the approach of another "Maunder Minimum", the seventeenth-century period covering many years when it is thought that there was only minimal sunspot activity; a period noted for its very cold weather (some critics still believe the Maunder Minimum may be a myth brought about by political conditions in China, where the sunspot records go back over many centuries but are now suspect).

The satellite observations suggest a drop over the past 18 months of less than 0·1 per cent; this may not seem a startling figure but some scientists believe it could represent a continuing change sufficient to upset the earth's fragile ecosystem. But to return to the predictions. G3USF writes: "When it comes to 'conditions' most hf amateurs fall into one of two categories. There are those who are content, as the song puts it, to take 'one day at a time'. And there are those who like to have some idea of the shape of things to come. In a memorable article, F. M. Smith, G8KG, (*Rad Com,* July 1976) predicted that Cycle 21 would peak at a smoothed sunspot number of 150 or higher from late in 1980. Though the peak came rather sooner than G8KG forecast, he was almost spot on with his prediction of the height—and much better than some of the analyses in the professional journals which, as *TT* has noted from time to time, mostly predicted a *low* peak.

"But a recent paper by Kapoor and Wu, 'Developing Forecasting Charts for Sunspot Numbers' (*Journal of Geophysical Research,* Vol 87, No A1, pp9-16, 1 January 1982) employs statistical modelling techniques to look forward until the end of the century. As they see it, we can look forward to a low 'low' of about 6·5 (as against 12·6 for 1976), rising to a peak of around 118 in 1990-1. So by their reckoning, conditions at the end of the decade should possibly be a shade better than those enjoyed at the peak of Cycle 20, but well below the levels we have seen over the past two or three years. But, as G8KG (of whose work Kapoor and Wu seem regrettably unaware) remarked, 'this product carries no guarantee'. It would be interesting to learn how G8KG sees the future.

"Sunspots are one thing; 'conditions' perhaps something rather different. Apart from the obvious effects of magnetic activity on propagation, there are other important effects. A recent paper by Smith and King of the Rutherford and Appleton Laboratories, "Long-term relationships between sunspots, solar faculae and the ionosphere" (*Journal of Atmospheric and Terrestrial Physics,* Vol 43, No 10, pp1057-63, 1981) shows that the relationship between sunspot numbers and the critical frequencies of the F and E layers have varied appreciably over time. Thus for a given sunspot number the corresponding critical frequency declined by about 1MHz between 1933 and 1950. Between 1950 and 1973—at which point their data tantalizingly run out—it recovered by almost the same amount. While 1MHz may not sound much, when the appropriate factors are taken into account it can make a significant difference to the propagation possibilities of the higher hf bands in particular. The authors attribute this variation to variations in the area of photospheric faculae on the sun, which normally provide about 40 per cent, but sometimes over 50 per cent, of the contribution to the solar ionizing flux associated with sunspots. The authors underline the significance of their findings to ionospheric forecasting systems. Unfortunately their final word is that the Royal Greenwich Observatory has discontinued measurement of facular areas. So it rather looks that for the present we have no means of knowing whether, in the years ahead, those faculae will be working for us or against us."

Murphy's Law must surely suggest that we cannot expect much help from the faculae!

70MHz award-winning station

Jack Hum, G5UM, the RSGB vhf awards manager, has brought to my attention the set-up used by G3TCT in his successful bid for a rare 70MHz 6+25 squares award: Fig 5. In his accompanying letter, Graham Kimbell, G3TCT, points out that his station is all homebrew equipment mostly based on items that have appeared in *TT,* although these have been subject to some modification. Again, it shows that home-construction can still bring its own reward!

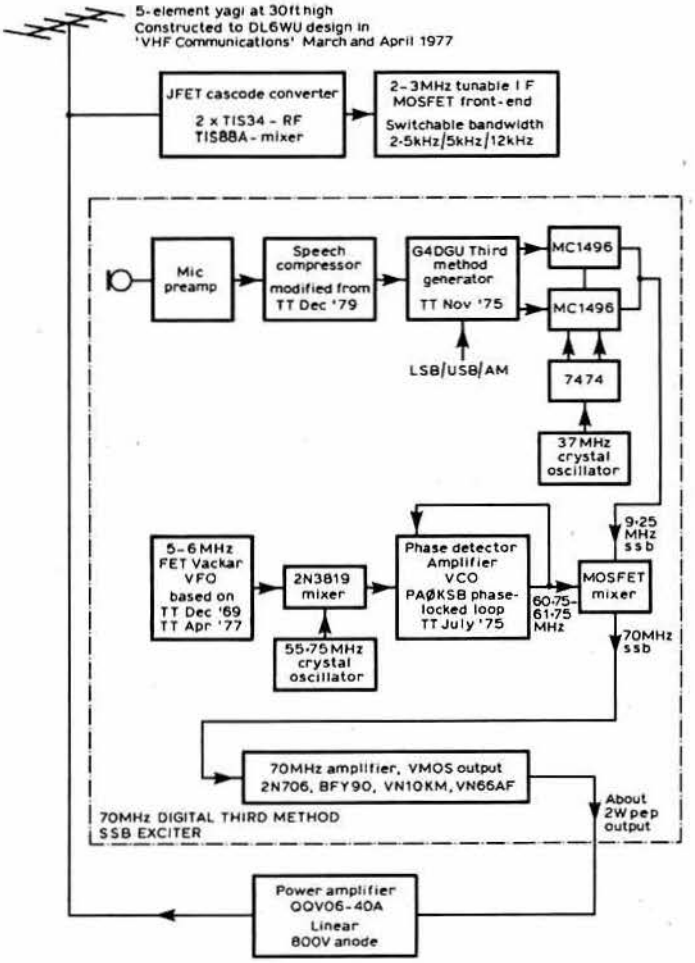

Fig 5. The "all homebrew" set-up used by G3TCT on 70MHz, showing the sources of the original ideas (although circuits have been modified for this application)

Simple programmable morse sender

Trevor Hopkins, G8TYY, heard some rather poor morse being sent from a hidden station during a 1·8MHz df contest. However, when taxed with this the operator was unabashed, retorting that who could be expected to send copper-plate code while lying on his stomach in a cold, wet bush in the middle of the night! G8TYY recognized the force of this argument, but the incident set him thinking about the design of a simple programmable sender

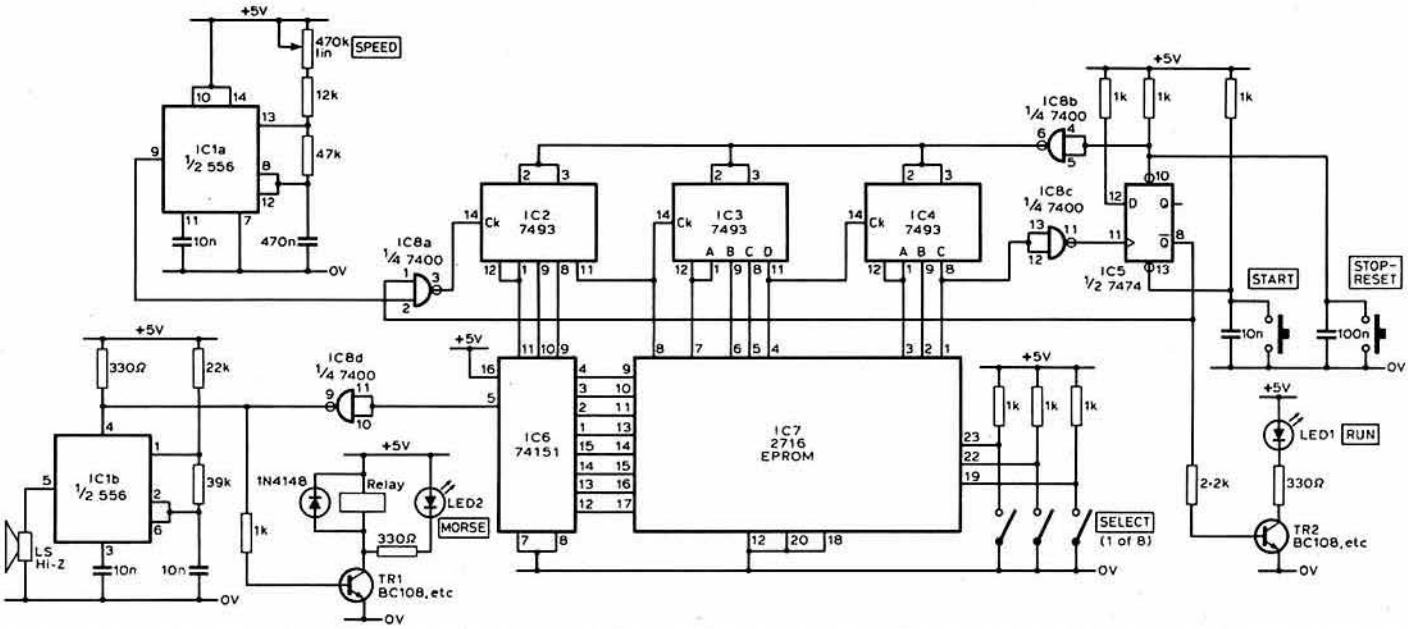

Fig 6. Simple programmable automatic morse sender using an eprom device. Power supply decoupling is not shown. There are ferrite beads in the psu line to prevent rf getting into the system

that would not only function happily in a gorse bush but could have a number of other uses. He writes:

"The heart of this device (Fig 6) is an erasable programmable read-only memory (eprom) type 2716. These are readily available, and quite a few people with home computers have the appropriate programming facilities. The code is stored in a very simple form; an '0' in the eprom produces a tone at the output, so that the bit pattern '00010111' produces the letter 'N'. An oscillator based on half of a 556 timer (the 556 device is equivalent to two 555 timer ic devices in a single package) produces the 'clock' pulses for the three 7493 divide-by-16 counters. The outputs from these address the eprom and the multiplexer IC6, so that the output from the multiplexer is a voltage representing the required code symbols. This is used to switch an audio 'sidetone' oscillator, a light emitting diode (l.e.d.) and a small relay to key the transmitter. The use of a relay is optional, but as such a keyer may be used to operate a variety of valved or transistorized transmitters, it was considered advisable. IC5 provides 'start' and 'stop/reset' facilities, and the sender stops automatically at the end of a message. Three switches allow the selection of any one of eight preprogrammed messages.

"This type of sender is very simple to use (push-to-start) and cannot 'forget' the messages, which can be of useful length. Each of the eight stores can contain a message of the form TEST DF TEST DF DE G3FVA/P G3FVA/P repeated six times. It represents a no-frills kiss design along the lines expounded in *TT* many times. It can be used in the shack, or as the keyer for a beacon, and during contests of many types. If you are not one of those who insist on using microprocessors in everything, why not try constructing a simple eprom programmer?"

HF Antennas for All Locations

TT has always endeavoured to devote a good deal of attention to the ever-interesting subjects of antennas and hf propagation, and I hope this will continue. But in future it is going to be a lot more difficult. This is because all *TT* readers will surely flock to buy their own copy of *HF Antennas for All Locations* in which Leslie Moxon, G6XN, distils a lifetime of wisdom and antenna lore. Now I can scarcely believe there is much more that can usefully be written on the subject (though we must try!). It is a good read; it is controversial but reliable; it makes so many of our problems seem understandable at last—and tells us how to solve them. At a basic price of £5 (hard covers) for 260 large pages and hundreds of clearly-drawn diagrams it is a real bargain. This column is decidedly not in the business of selling books, even those published by the RSGB, but there has to be an exception to every rule! Hurry before they sell out.

Tips and topics

Richard Limebear, G3RWL, noted the rather complex regulator for operating 9V hand-held units from car batteries (*TT* January 1982), and reminds readers of his suggestion last year of putting a diode in series with the supply to reduce voltage independently of current. He points out that this technique can be extended to drop higher voltage if a zener diode (or diodes) is used (choose the zener voltage equal to the number of volts that need to be dropped, not to equal the final voltage required). With diodes and zener diodes the current and power rating should be taken into account. Where lots of watts are involved it may prove cheaper to use more than one zener diode in series since 10W zener diodes at about 3V are fairly reasonably priced (around £2 or even less) and still work out cheaper than a complete regulator. But remember that series diodes and zener diodes provide a fixed voltage drop, regardless of current, and may not protect against really excessive voltages generated, for example, when the car alternator is running.

Jack Hum, G5UM, relays an enquiry from VK3XX (ex-G3EGK of Leicester) on rfi and emc problems with home computers. It is well known that home computers are often a prolific source of rfi (FCC has laid down some tough limits for home computers) but VK3XX wonders whether the beasts are themselves susceptible to interference from amateur transmitters —and in particular whether you can lose data or programs stored in the computer. If so at what sort of power levels and distances?

J. R. Bell, G3UYX, of British Telecom Research Laboratories, points out that in my notes on the Home Office and British Telecom trials of 160MHz mobile ssb (*TT* February) I assumed these were all part of the same series of tests. In fact those of BT were entirely separate, were concerned with potential use of ssb for the public Radiophone service, and were held under very carefully controlled conditions. This makes it perhaps all the more significant that from both series of tests, the fm mode (particularly with 25kHz channelling) emerged as the clear winner, with ssb more affected by doppler and fast fading when in motion—and also requiring substantially more protection against co-channel interference.

Norman Fitch, G3FPK, agrees with the March *TT* comment that high-current 12V power supply units can be built for half, or less, than the cost of factory units, depending on how much you pay for a decent case. However, he stresses the need to select transformers of adequate VA rating, and is a little concerned at the use of an ILP 300VA toroidal in a 24A supply (ILP he finds can supply 550VA cores with four secondary windings). He points out that with a full-wave bridge rectifier and capacitive input filter, dc output should normally not exceed 0·62 times the ac rating of the secondary winding. While G3FPK is of course technically correct, it is worth remembering that in this type of application, the "duty cycle" is an important factor that can permit the use of low-rated transformers without running them excessively hot. For example, ssb transmitters normally have a very low duty cycle (unless heavily processed speech is being used), while with the higher duty cycle of fm the operator does (or should) spend as much or more time listening as transmitting. Less controversially, G3FPK also stresses the value of crowbar over-voltage protection if you intend to use a high-current psu for a high-cost transceiver, a point which has been made a number of times in *TT*. He draws attention to the articles by G4FRX in *SWM*, April and May 1980, concerning such points as choice of pass transistors and heatsink requirements for such units.

4-2-70

John Morris, G4ANB*

Aurora

There was a good auroral event on 10 April, bringing 144MHz contacts into many parts of Europe. G4ASR (YM76d) made two particularly good contacts. UQ2GLO (KQ49g) in Latvia was worked at 1541gmt, the distance between the two stations being 1,655km. This was soon followed by a 1,730km contact with UP2BJB (LP06d) in Lithuania at 1608gmt. G4ASR's beam heading was 40° for both contacts. Other stations worked by G4ASR during the opening included SK7JDS (IR square), SM4AIQ (HT), SM5DFF (IS) plus many DLs.

GI6CJG worked several Continental stations between 1555 and 1601gmt, and a few more during a second phase from 2225 to 2237gmt. The best, all on ssb, were PE1DAB (CN68f), DG3VW (DJ45e) and F1FIH (ZI05d). The best beam heading for GI6CJG varied from 60 to 65° during the first phase and stayed at 50° during the second.

50MHz

Transatlantic 50MHz propagation has been dying down over the last few months as expected, but there have still been plenty of openings on the north-south path. Dave Newman, G4GLT, near Leicester, uses a five-element Tonna and a Microwave Modules converter for 50MHz receiving, and on 14 February copied his first signals from ZS in the form of the ZS6DN beacon on 50·060MHz (ZS6DN should since have moved to 50·055MHz). ZS6DN and ZS6PW were heard on several days during the next couple of weeks, typically at about 1200–1500gmt, and on 11 March a crossband contact was made with ZS6LN.

During the rest of March the ZS6DN, ZS6PW, ZS3AK, ZS1STB and ZS3E beacons were heard by G4GLT on many occasions, and several crossband QSOs made. On 16 March ZS6DN was audible intermittently from 1750 to 1920gmt with the "fluttery" note typical of transequatorial propagation. Towards the end of the month meteor pings were noticed on many signals.

The last transatlantic signal reported by G4BPY was the FY7THF beacon at 1702gmt on 10 February. The ZS beacons were received during many days in March, and on 15 March G4BPY made his first-ever observation of transequatorial propagation at 50MHz when ZS6DN was heard at 1937–1957gmt. ZS6DN appeared by tep again at 1758–1828gmt on 16 March, when the best beam heading for G4BPY was about 30°E of the great circle path.

G4GLT found what he calls a "most incredible opening" on 12 April. ZS6DN became audible unusually early at 1016gmt, and as the day wore on most of the other ZS beacons could also be heard at good strength. Crossband 28–50MHz contacts were completed with ZS3E, ZS5TR, ZS6BT, ZS2FM, ZS6BMS, ZS6BUF and ZS6XJ between 1055 and 1640gmt. The QRP beacon ZS5VHF, in Durban, which runs only 20W to a halo, was heard on 50·080MHz at 1316gmt. Conditions faded at 1707gmt, when ZS3E finally disappeared into the noise.

Moonbounce

Members of the Banningham EME Group, G4EZN, G4JNX, G3CWI and G4FIL, have rebuilt their 9m eme dish to incorporate some modifications and improvements. The result is a 12m diameter parabolic dish with motorized tracking in elevation and the possibility of adding motorized control of azimuth at some future date.

Some time was spent optimizing the dish and checking its performance. The usual way of doing this is to measure sun noise, but this technique can be rather unreliable because of the variability in the sun's rf output. The Banningham group decided instead to use the two strongest radio sources (apart from the sun) in the sky; Cassiopeia A, a supernova remnant within our own galaxy; and Cygnus A, a rather more distant (about 500 million light years—that really *is* dx) radio galaxy. The radio fluxes of these objects are well known and quite stable, making them useful for optimizing large antennas.

Over the weekend 2–4 April the opportunity was taken to try out the antenna in the first leg of the ARRL EME Contest. Fortunately the weather was reasonably calm, an essential requirement when using a 12m dish! During a total of 24h spent operating, 36 contacts were made on 432MHz, including 13 countries and eight of the W/VE call areas. All of the contacts were made on random, and every station heard was worked. There were, however, long periods when no new stations could be found on the band, and when a new callsign did appear there was the unusual phenomenon of a pile-up off the moon.

Activity from Europe was high, but comparatively few stations in other continents were heard. The best dx were JA6CZD and JA9BOH. In terms of signal strength the best contact was YU1AW, with whom S5 reports were exchanged on ssb. YU1AW also uses a 12m diameter dish.

The Banningham operators were able to copy their own echoes from the moon at good strength on both ssb and cw, but with considerable variation according to the time of day. They have expressed their thanks to G3YGF for invaluable help in testing the dish, operating during the contest, and loan of equipment; and to the RSGB for help with licensing.

On 144MHz the four 19-element Cushcraft Boomers of G4DZU also proved effective during the eme contest. Over the weekend a total of 10 stations were worked off the moon, including YV5ZZ to give G4DZU his 144MHz WAC. The line-up at G4DZU is a Drake T4XC plus homebrew transverter on transmit, with a homebrew gasfet preamplifier into an SRA1WH mixer feeding a Drake R4C on receive. An Autek audio filter helps dig out the weak ones. The antenna system has full azimuth and elevation control and is fed by 0·875in diameter Andrews coaxial cable with 0·5in diameter cable from the power divider to each Yagi.

KR5F (ex G5CSZ/W4FAY) is in the unusual, if not unique, position of having operated 144MHz eme from both sides of the Atlantic. His activities as G5CSZ from Yorkshire have been described in previous issues of *4-2-70*, and he is now operational again from Galveston, Texas, under the new callsign KR5F. After many man-hours of work setting up the new station, KR5F worked 29 stations off the moon during his first month of operation, including G4DZU and several others in Europe. The antenna system consists of four 16-element Tonnas driven by an 8877 pa with a gasfet preamplifier on receive.

Repeater news

UHF Phase 7 has now been closed and is being put through the final vetting process ready for submission to the Home Office to be considered for licensing later this year. A few of the 20 or so proposals originally in this batch have been put back to Phase 8 because the full paperwork had not been supplied by the Repeater Working Group's deadline. The proposed callsigns, channels and locations of the 15 remaining are:

GB3BE RB6	Bury St Edmunds	GB3KB RB0	Biggin Hill, Kent
GB3CA RB13	Carlisle	GB3KR RB4	Kidderminster
GB3CY RB13	York	GB3LA RB11	Leeds
GB3DS RB13	Worksop	GB3PP RB15	Preston
GB3GD RB12	Near Leicester	GB3SU RB15	Sudbury
GB3GH RB15	Gainsborough	GB3SZ RB15	Bournemouth
GB3GU RB13	Guernsey	GB3YS	Yeovil
GB3HK RB14	Hawick, Borders		

The proposed channel for GB3YS has yet to be finally settled, but will probably be either RB2 orRB15. All of the channels may be subject to last minute change before the batch is submitted. GB3GD is to be an rtty/data repeater. So far there are about a dozen tentative proposals for uhf Phase 8.

VHF Phase 5 was due to be submitted to the Home Office within a few days of this being written. A full list of the 145MHz repeater network, including the vhf Phase 5 proposals, was given in April's *4-2-70*.

UHF Phase 6 was sent to the Home Office to be considered for licensing in November 1981, but at the time of writing no licences have yet been issued. In the past the time between a batch being submitted and the first licences coming out has been two to four months. No official explanation for this inordinately long delay has been forthcoming, although one may surmise that sorting out the general confusion around the new schedule has taken priority over other matters.

Beacons

The new 70MHz beacon, GB3ANG (70·060MHz, YQ35c), described in last month's *4-2-70* came on the air two days ahead of schedule on 9 April, although the antenna system is rather different to that originally planned. The intention was to feed part of the power to a two-element beam pointing,

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due north for auroral indication, and this was in fact done for the first week or so of operation. However, even during the excellent event on 10 April, the auroral signal from the beacon was not particularly good, probably due to a relatively poor take-off to the north from the GB3ANG site. Because of this and some mechanical and interference problems, it was decided to simplify the antenna system to just a single three-element Yagi at about 7m agl beaming SSE.

Good signal reports for the new beacon have been received from as far afield as southwest England and East Anglia. G3UUT in Cambridge has copied many meteor bursts and has been able to decipher the high speed cw sent by GB3ANG. The ms signals should be even better on the south coast. Any further tropo or ms reception reports for GB3ANG would be welcomed by GM3WOJ, QTHR.

New 70 and 144MHz antennas being fitted at the GB3ANG beacon installation. Up the pole and on the tiles are, l to r: Chris Tran, GM3WOJ; Peter Bates, GM4BYF; and Malcolm Hamilton, GM3TAL. *Photo:* G3UUT

The change of antenna for the 144·975MHz beacon at GB3ANG also went according to plan. At about 8m agl the new SSE-pointing four-element Yagi is considerably lower than the old antenna, but the superb southerly take-off from the site—the ground slopes away at an angle of about 30°—means that this is not too important. Indeed, the lower position means that the feeder cable is much shorter, giving less loss between transmitter and antenna, and the signal to the south is reported to be some 2–3dB better than with the old arrangement.

While working on the 70 and 144MHz beacons, the opportunity was taken to carry out a few informal site tests on 432MHz, and all the indications are that if and when a beacon can be put on the air on this band at GB3ANG it should be widely audible and a very useful propagation indicator.

A solidstate power amplifier and associated psu are needed for the uhf beacon GB3SUT (432·890MHz, ZM31b). The requirement is for an amplifier which can run *continuously* giving 25W or so output from 5W input and is capable of working without attention in an environment which suffers extremes of temperature throughout the year. Any offers of help would be gratefully received by the beacon keeper, G3BA, QTHR.

A new antenna system is being planned for GB3VHF (144·925MHz, AL52j) to give better coverage up the country. The present antennas have given reliable service for many years, but are now beginning to show signs of old age. The intention is to replace them with a pair of heavy duty three-element Yagis, although the exact timescale for the change is not known at the time of writing.

Contests

Young Operators' Field Day

1000–1300 3 July

This short event is organized by the Central Radio Club of Czechoslovakia to take place during the hours before the start of VHF NFD proper, and is open to all radio amateurs who are *less* than 18 years old on the day of the contest. There are two sections: **(1)** 144MHz, 25W maximum output, any type of transmitter; **(2)** 432MHz, 5W maximum, transistorized equipment only powered by "chemical or solar sources (battery, storage battery etc)". Operation must be from a portable site. Repeater contacts are invalid. The exchange is RS/T plus serial number from 001 on each band plus QTH locator. Scoring is one point/km. Logs must contain "all necessary data", plus claimed score, birth dates of operators, and a declaration that the rules and regulations of the contest have been observed. Use separate logs for each band. Entries should be sent by 19 July to: The Central Radio Club, Vlnita 33, 147 00 Praha 4, Czechoslovakia.

The Czechoslovakian society also organizes its own version of VHF NFD over the same 24h as the UK event. There are six sections: **(1)** 144MHz, 5W maximum output, chemical or solar power; **(2)** 144MHz, any output according to licence conditions: **(3)** 432MHz, 5W, chemical or solar power; **(4)** 432MHz; **(5)** 1,296MHz; **(6)** 2,304MHz. In the last three sections any output power may be used up to the legal limit. Other details are as above.

Expeditions

GM3WOJ and GM4IGS are planning an ms expedition to the Orkney Islands for the Perseids meteor shower. They hope to operate on 70 and 144MHz from 6 to 12 August, spending three days in each of YS and YT locator squares, and possibly also XS en route. The callsign on the lower band will be GM3WOJ/P, and operation will be on 70·175MHz for both ssb and cw. On 144MHz the callsign will be GM4IGS/P and the frequency 144·175MHz, again for both ssb and cw.

During an expedition to XS and YS locator squares during the 1981 Perseids, GM3WOJ/P worked a total of 38 stations on 70MHz and gained much useful experience. The intention this year is to use streamlined operating techniques and to concentrate on ms contacts rather than relying on unreliable tropo conditions.

Skeds for the expedition would be welcomed and should be arranged with GM3WOJ for 70MHz and GM4IGS for 144MHz (both operators are QTHR). In addition, 7,077 and 14,345kHz will be used for "talk-links" during the actual expedition at 1300gmt each day.

G4JVG, G4IWA, G8SYE and G8IXG are planning an ms expedition to KT square for the Perseids. They intend to operate from the tiny Baltic island of Kökar, which is just about the only bit of land in the square, from 10 to 19 August. The equipment will be an FT225RD with the Mutek board and a pair of 4CX350As, probably feeding one or more Boomers. The periods will be 1min on ssb and 5min on cw at around 800lpm. The callsign to be used is not known at the time of writing. Skeds can be arranged by contacting G8IXG at: 2 Flaxman Close, Earley, Reading, Berks; or on the 14,345kHz vhf net during the expedition.

About 10 members of Liverpool University ARS will be going to XJ square, on the Lizard point, from 14 to 21 July. They hope to be operational on 144 and 432MHz plus most of the hf and some of the microwave bands. Skeds may be arranged by writing to G3OUL, QTHR. Further details will be sent to GB2RS nearer the time.

Locator systems

The main reason for the narrow decision by the IARU Region 1 Conference in Brighton last year not to adopt the proposed new locator system in place of the "QRA" (*Rad Com,* November 1980) was lack of support from Regions 2 and 3 of the IARU. Many societies were understandably reluctant to change to a new system when there was a possibility that at some later date the rest of the world might adopt yet another. Such support was hard to come by, as it is only within Region 1, particularly in Europe, that amateurs have any extensive experience with locator systems, and the view was expressed by the Region 3 secretary that the rest of the world was waiting for a lead to come from us!

At the IARU Region 3 Conference held in Manilla over 2–5 April, a resolution was passed expressing support for the proposed new system.

(Region 3 consists of Oceania and parts of Asia.) The essential part of the resolution was that "the Human Language Code System developed by JARL be adopted within Region 3 for amateur radio purposes for transmitting the position of a station, and that the proposed Region 1 locator system be adopted for use within Region 3 when the time is appropriate".

In other words, Region 3 delegates felt that there was no need for any sort of locator system at once, as vhf/uhf is far less developed in that part of the world than in Europe, but they have effectively agreed not to adopt any *different* system.

The "Human Language" system produced by the Japanese society, JARL, is not a QTH locator system but latitude and longitude sent in a formalized way. It is best illustrated by example; 127° 43'E, 54° 32'S would be sent as "S5432 E12743", and similarly 10° 26'W, 52° 3'N would be "N5203 W1026". An agreed way of sending latitude and longitude is long overdue, and it is to be hoped that the rest of the world will follow the lead from Region 3. However, it is not a true locator system as European amateurs familiar with the QTH locator would understand the term.

The important part of the resolution, at least so far as Region 1 vhf/uhf operators are concerned, is the commitment not to adopt any *other* locator system. If a similar agreement can be reached at the Region 2 (the Americas) conference next year then the way will be open for Region 1 to make a positive decision at the next conference, which is due to be held in Italy in 1984.

30 and 10 years ago

"As an example of sustained activity—and incidentally an indication of the number of stations operating on two these days—it would be hard to beat G3WW's effort of 82 different stations *worked* during the period April 15–May 18, with a dozen or so others heard but not contacted."—G2UJ in *Around the V.H.F.'s*, June 1952.

" 'The basic problem,' said G3FZL in conclusion, 'is that a population on the vhf/uhf bands increasing at a rate of 10 per cent per annum means that we have got to learn to live with one another under more crowded conditions. More discipline and self-restraint will help us all derive maximum enjoyment from the metre wavelengths in spite of increasing population'."—G5UM in *Four Metres and Down*, June 1972, reporting the opening address at the 1972 VHF-UHF Convention.

Awards

Bert McCann, G3AZI, of Preston, has taken Four Metres and Down Supreme Award No 38, the first to be issued this year. G3AZI already held FMD Seniors on 144 and 432MHz, and qualified for the Supreme by submitting a claim for 70MHz Senior No 47. This award is the culmination of many years of tenacious effort by G3AZI, whose 30m asl site 16km away from Winter Hill is far from ideal for vhf/uhf. It took him three years to attain the 70MHz Standard, back in 1967, but another 15 to reach the Senior. He is now planning to attack the 1,296MHz FMD awards.

The G3AZI award was rapidly followed by a claim for 1,296MHz Standard No 31 from Paul Lawrence, G8BWR, of Warwick. As G8BWR was also already a holder of 144 and 432MHz Seniors this automatically gave him FMD Supreme Award No 39.

Back on 70MHz, G3LXP, of St Albans, has taken FMD Standard No 141, while G3TCT, of Hampshire, has been awarded 4-2-70 Squares 25/6 No 2.

G4HAO, of Liverpool, has claimed 144MHz FMD Senior No 183, and also 4-2-70 Squares 40/10 No 81. On the same band G6ADH, of Surrey, has been awarded FMD Standard No 604 (the first G6+3 callsign to take this award) as well as the 4-2-70 Squares 40/10 award, which was upgraded just a few weeks later to the 60/15 level.

G8TRW and G8WUU of Essex chose just the right time for their expedition to the Lizard, Cornwall, in rare XJ locator square, during 1981. They arrived at the portable site on 25 July, in the middle of "that" aurora; the largest ever recorded in Europe. They were forewarned by hearing tone-A signals on the mobile rig while still travelling, and on arrival immediately started putting the station on the air. If a prize for the fastest erection of a 16-element 144MHz Tonna is ever introduced, G8TRW and G8WUU reckon they should have a good chance of taking it.

Between 25-30 July G8TRW/P worked most of Europe, including 70 QTH locator squares, from the 100m asl clifftop site at the Lizard with its sea take-off on three sides. Some of these contacts produced the cards which have now given 144MHz 4-2-70 Squares No 76 to G8TRW/P.

A double claim was submitted by G4DFI of Bexley Heath in north Kent, who has taken FMD Standard No 603 and 4-2-70 Squares No 77, both for operation on 144MHz. In the higher categories of the same band G4HMF of Ipswich has taken a sticker for 20 countries and 100 squares. Another Ipswich station, G3XDY, has become the third claimant of a sticker for 13 countries and 50 squares confirmed on 432MHz.

A reminder has come from the vhf awards manager, G5UM, that when applying for a sticker to upgrade a 4-2-70 squares award to a higher category it is not necessary to send all of the cards all over again. Just the QSL cards for the extra contacts will suffice, so long as they are accompanied by the original check log or a photocopy of it. This procedure saves a great deal of postage costs and avoids having those valuable cards shuttling back and forth each time a new sticker is claimed.

Clean signals

The request in March *4-2-70* for information on possible vhf/uhf records prompted Bob Maddex, G8UZG, and Rosalie Keeling, G8YDB, to submit the following report claiming a "first" for their QSO on 26 March 1982:

"The unique nature of this contact was that both operators were in their respective baths at the time; G8YDB at Bath University and G8UZG in the town itself. The transmission mode was fm and the antennae were of course rubber ducks. The propagation mode is believed to have been direct wave, although a certain amount of rf may have travelled through the interconnecting plumbing.

"Should anyone have beaten us to this claim, perhaps you would still consider it as the first such contact in the Roman city of Bath itself.

"As you may have guessed, we are both students at Bath University, and are inseparable from our portables; an FT207 and an IC2E.

"PS—we do not operate amateur television."

Scatter

The sight of people walking along the street wearing lightweight headphones connected to portable tape players has become almost commonplace. Council member GM8FFX recently returned from a business trip to Japan where it seems that Standard have now introduced a low-power portable 50MHz transceiver, complete with headphones and miniature boom microphone, called the "Talkman".

G4KLN has suggested that as well as having a special meteor scatter award, ms contacts should be made invalid for the normal 4-2-70 Squares awards: "I say this after listening several times to the 14MHz vhf net with stations passing on all information on the contact before and after the vhf sked. This is to me too artificial and I feel that people who do not use ms complete more realistic contacts. Obviously there are many QSOs on ms which are not completed in this manner and these deserve full credit. This is why I believe ms contacts should be recognized in a different light to other propagation modes."

GM3XOQ has moved QTH back to Shetland and is reported to be looking for 144MHz ssb tropo contacts.

Dave and Judith Brooks, G4IAR and G4IAQ, are the QSL Bureau sub-managers for the entire G6+3 series, giving them responsibility for handling the cards of a large number of vhf/uhf enthusiasts. By the time this is published licences will hopefully be being issued again, and they can expect a large upturn in business. Some of the envelopes they have recently been receiving for the collection of QSL cards have ranged from far too small to far too big. The smaller ones will simply not hold any cards, while the larger sizes cause problems in the filing system and are definitely not cost-effective; some have been themselves nearly up to the postal weight limit without any cards being added! They find the ideal size is about 7·5 by 5in.

Oversized cards also cause problems as they have to be folded to get them into sensibly sized envelopes. No matter how attractive a 9in long card may be, its artistic merit is unlikely to be enhanced by a crease down the middle. The final reminder from G4IAR and G4IAQ is that outgoing cards should be sent to G3DRN at the main bureau and not to them.

There was a useful tropo lift on 25 March. Because most of his gear was at the alternative QTH, G4MAD (AL54c) found himself restricted to running 1W into an HB9CV in the loft, and gave up fighting on ssb in favour of cw. Despite the low power and temporary antenna, he worked into France, Belgium and the Netherlands during a two-hour stint. G4MAD's comment was: "It shows what a meagre watt or so can do using the correct mode in a QRM-free part of the band. Now I'm waiting for the QSLs to prove it all!"

Congratulations to Marion, wife of meteor scatter enthusiast G4ASR, on the birth of a son, Benjamin. The training of those 4am skeds is going to come in useful for G4ASR at last! The rumour that he recorded the child's first cry, played it back at slow speed, and started sending "R27" is, apparently, without foundation.

Please send all news and views for August to arrive by 12 June (late news by 22 June) and for September by 10 July (late news by 20 July). □

RSGB National VHF Convention 1982

by JOHN MORRIS, G4ANB, and
CHARLES SUCKLING, G3WDG

Photos: DAVID CUTTS, G4FAW

THE RSGB NATIONAL VHF CONVENTION 1982 took place at Sandown Park racecourse on 20 March. A convention is, or should be, more than a rally, more than a series of lectures, more than a purely social event. Ideally it should combine the best features of all three. The 1982 VHF Convention came very close to reaching this ideal.

Sandown Park is admittedly not the easiest place to get to, especially by public transport (mental note: next year turn *right* on leaving Esher station), but the trip proved well worthwhile. For the first time the trade show was held in the huge main concourse of the racecourse grandstand. The enormous area available meant that even with 1,300 visitors milling about the 36 trade stands it was still very easy to move around. A contrast indeed to the old "Winning Post" days!

A noticeable trend was that "bits and bolt-on goodies" were in much greater demand than "black boxes". Is this a reflection of the recession, or of a changing trend in amateur radio? In particular demand were Wood & Douglas' atv up-converter, Microwave Modules' "Morse Talker", Mutek's low-noise preamplifiers, Bamber's ex-pmr rigs for conversion, Randam's antennas and Cambrian's 4CX series valves and bases.

The RSGB stand and bookstall was a popular attraction, and the specialist organizations, AMSAT UK, BATC and BARTG, were all well represented and collected many new recruits. The ever-popular "Bring and Buy" stall, run by members of the Echelford ARS under the leadership of G2FNK, did a roaring trade.

The standard of catering was a great improvement over last year, with four bars, two snack and two alcoholic, open throughout the day. Quite a few visitors noticed that the sticky labels on the sandwich wrappers could be peeled off and attached to jacket lapels, which explains the large number of bodies seen wandering around wearing "HAM" signs. Why one person should have been labelled "TURKEY" remains a mystery.

By 2pm, after a hard morning spent treading the boards and meeting old and new friends, the opportunity to rest the feet and exercise the mind at the formal part of the proceedings was most welcome. The RSGB executive vice-President, Bob Barrett, GW8HEZ, officially opened the convention, and at 2.15pm the lectures began.

As in previous years there were three simultaneous streams, each of three lectures. One of the hardest choices was which three out of nine very enticing talks to attend! Every one of the lectures could have been turned into a full *Rad Com* article; and if the right arms can be twisted hard enough one or two of them might be. There are also plans to make up tape/slide presentations based on the material presented in some of the talks.

Two of the convention lecturers, SM5CHK (l) and G4ASR, in relaxed mood during the evening

Stream A

The aim in VHF Convention lectures has always been to bring in the acknowledged expert in a particular subject. When it comes to antenna gain measurement the person with more practical experience than just about anyone else in Europe is Oscar Bäckman, SM5CHK, who was flown in especially for the convention and gave the opening lecture in Stream A.

SM5CHK started by describing the requirements for accurate gain measurements. The antenna must be measured under far-field conditions, and the field must be uniform. Calculations show that this means a measuring range about 50m long on 144MHz. Considerable care must be taken to minimize the effects of ground reflections, and Oscar gave details of the methods used at the Swedish Ånnaböda conventions; such as fences half-way along the range, strategically placed power-absorbing dipoles with resistive loads, and a counter-antenna with gain tilted slightly upwards. In effect the aim is to simulate, as far as possible, free-space conditions.

The results from Ånnaböda showed that all too often the gains specified by antenna manufacturers are rather different to those measured independently. SM5CHK had unfortunately left behind in Sweden his pile of handouts listing the results, but copies may be obtained by sending an sae to Ian White, G3SEK, at 52 Abingdon Road, Drayton, Abingdon, Oxon OX14 4HP.

The final point made by SM5CHK was that measuring 100 or so antennas in a single weekend takes a lot of careful preparation, needs the right equipment, and involves a massive amount of hard work. He gave a checklist of how such an event should be organized, and it was noticeable that the organizers of various vhf/uhf meetings around the UK were in the audience taking copious notes!

Second on the bill was John Nelson, G4FRX, who gave a follow-up talk to his 1981 lecture on the use of 4CX250 series valves in vhf/uhf power amplifiers. He made the point that intermodulation performance that was acceptable 20 years ago is simply not good enough in today's crowded bands. Valves in the 4CX series are capable of producing excellent results so long as they are used correctly. Particular care and attention must be paid to the screen supply, which should be capable of sinking as well as being a source of current without voltage change; zener chains are not good enough. For clean operation with two-valve amplifiers it should be possible to vary the screen voltages independently to give good dynamic balance. In fact, building a really good psu can be rather more difficult than construction of the actual amplifier!

It is also important to use the correct valve bases if the amplifier is to be unconditionally stable. As G4FRX pointed out, the expected operational life of a 4CX250B is around 20,000 hours if used properly, and so it is worth investing some time, effort and money to produce a really good amplifier which will last a lifetime.

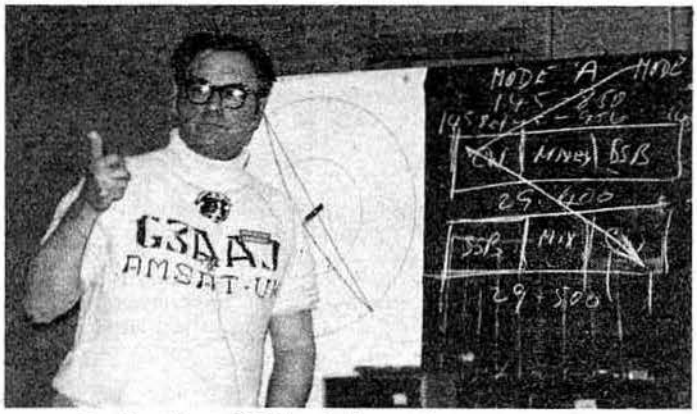
The last item in Stream A was the VHF Contests Committee Forum, where members availed themselves of the opportunity to comment on Society contests. The discussion was extremely lively and wide ranging, covering most aspects of contest rules and format, with VHF NFD a particularly popular topic. Members of the committee were certainly left in no doubt about the opinions of those attending the forum, and they will be considering the many points raised during future meetings.

Stream B

Ron Broadbent, G3AAJ, the secretary of AMSAT UK, opened Stream B with a two-part talk. In the first half he described the history and purpose of UOSAT, illustrated by slides of the satellite being built and of the launch. He emphasized that UOSAT is intended for many groups, including schools and computer hobbyists, as well as radio amateurs.

The second part of G3AAJ's talk was concerned with predicting the position of, and operating through, amateur communications satellites. Both of these are much easier than most people probably suspect; especially using the range of plotting aids available from AMSAT UK. Massive steerable antenna arrays are not needed to enjoy satellite working; simple dipoles and ground planes are all that are needed to "get your feet wet", especially on the 145 to 29MHz Mode A transponders.

There then followed an extremely interesting presentation by David Holmes, G4FZZ, intriguingly entitled "Pilot ssb—the replacement for fm?". G4FZZ started by describing the problems of communicating with and between mobile stations at vhf, and explained the cause of "mobile flutter"; because of intervening obstacles multipath reception gives rise to amplitude and phase modulation of the signal at a rate proportional to frequency and speed. In a very compelling demonstration using audio



Ron Broadbent, G3AAJ, pointing out the nearest satellite!

sources, members of the audience could hear this interference effect for themselves.

He described how the various transmission modes are affected by flutter. The most common mode, fm, copes well because of its inherent limiting properties. To get similar performance out of ssb some sort of reference is needed to allow effective agc and afc action. In "pilot ssb" a carrier is transmitted at about 10dB down on speech peaks for this purpose. The carrier may be variously positioned above, below, or even—with suitable filtering at the receiver—in the middle of the audio passband.

G4FZZ then played a series of recordings comparing 12·5kHz fm and pilot ssb. The results were, to the amateur ear at least, very impressive, although in tests it had been found that the "average" listener showed a marked preference for the fm. In his closing remarks G4FZZ said that there was great scope for experimentation, especially by amateurs. He stressed that pilot ssb should be thought of as a possible bandwidth-saving replacement for fm, and that it could and should not take over from normal ssb for dx working.

David Butler, G4ASR, was the last speaker in Stream B. He described meteor scatter propagation; what it is, when the regular meteor showers occur, and the ranges that can be expected on 144MHz. Specialized techniques must be used for ms, and G4ASR explained these with the aid of recordings of actual contacts and demonstrated some of the equipment used for high-speed cw.

His advice to budding ms operators was to visit an experienced operator to see how it *should* be done, and then to think—preferably for about a year—before going on the air. When actually operating, the important rules are: listen before you transmit; make sure your frequency and timing are spot-on; and follow the IARU recommended procedures.

Stream C

The first lecturer was Peter Tunbridge, G8DEK, who spoke on the subject of solidstate power generation at microwaves. For amplifiers up to a few gigahertz, silicon transistors could be used to generate several watts of power. For the higher microwave bands, power gasfets were available, which could be used in linear amplifiers. A serious drawback of both types of transistors is their high cost at the present time, but no doubt in a few years they will be available at a suitable price for amateur use.

Oscillators using two terminal devices were discussed next. Both Gunn and impatt devices can be used in power oscillators.

The last class of device to be described was varactor diodes. The main difficulty encountered with varactors is stability, and the use of an attenuator (3dB or more) between a transistor driver stage and a varactor multiplier was considered to be almost always essential.

The second lecture was given by Heath Rees, G3HWR, on the subject of the implications of the new millimetric-wave allocations. The propagation characteristics of the millimetric bands were outlined, and the main difference between them and the existing microwave bands is the higher (in some cases very much higher) propagation losses due to absorption by water vapour and/or oxygen. For the bands where water vapour absorption is the major effect, the best time for dx working would be in winter, with ambient temperatures below −10°C! This, coupled with the need to operate from elevated sites in order to get line-of-sight propagation, would make dx operating on these bands very interesting!

Equipment for these bands would probably consist of either free-running oscillators or frequency multipliers. The "crossed-waveguide" multiplier using a single diode to function as both the frequency multiplier and the receive mixer was an attractive approach for the lower frequency millimetric wavebands.

The final lecture was given by Graham Murchie, G4FSG; Julian Gannaway, G3YGF; and Mike Walters, G3JVL, on the subject of 1·3GHz mobile systems. G4FSG began by describing the specifications of the new 1·3GHz repeaters currently being built.

G3YGF then outlined recent experiments which had been carried out to investigate the propagation characteristics which would be experienced by mobile stations. He discussed the ranges which had been obtained in various types of terrain, including open country and urban environments. Both nbfm and ssb had been used, and the conclusions were that ssb was better for open terrain but that fm suffered less from distortion due to multipath propagation in town. Even so, fm was not without distortion, and suffered from a peculiar "clicking"—this was attributed to rapid phase reversals of the received signals as the antenna was moving through the standing wave patterns present in an urban environment.

G3JVL described two aspects of 1·3GHz mobile which he had been investigating over the past year or so. The first was horizontally-polarized omni-directional antennas. The Alford slot antenna had been found to perform very well—it had a good omni pattern and useful gain. Indeed it was considered that it was much easier to achieve gain using horizontal than with vertical polarization, since the techniques used at the lower frequencies (eg colinear antennas) would be difficult to use at 1·3GHz. The second area which he had investigated was filters for repeater duplexing. He had designed, built and measured waveguide filters, the performance of which was easily good enough to allow a single antenna to be used for the repeater when using the standard 6MHz transmit/receive spacing.

After the lectures

The last two events of the afternoon were an informal microwave meeting and the first agm of the newly-formed UK Six Metre Group. At the latter meeting the group's provisional terms of reference were confirmed and a new committee elected; further information is available from the secretary, G4JCC, QTHR.

After these meetings the exhibition hall rapidly emptied, the traders finished packing their wares, and soon the tables were all stacked away—leaving a vast, silent, empty hall reverberating gently to the footsteps of the occasional person passing through, in startling contrast to the noisy, bustling scene of only a few hours earlier. One might have been forgiven for thinking that it was all over, but this was not so. About 80 diehards had retired to the Cavalry room for the "social evening".

(Continued on page 507)

Members of the Martlesham RS and Ipswich RC with a few of the trophies collected during the evening. L to r: G4FZZ, G3ZNU, G6DDK, G3YCY, G3XDY, G8FQO, G4FRE, G8ONH and G4HMF

MICROWAVES

Charles Suckling, G3WDG*

Expedition news

News has just come in of a proposed expedition to Copeland Is, which is located off the Co Down coast, in XO23j. The expedition is being organized by members of the East Antrim ARC, and will be operational on 1·3 and 10GHz during the weekend of 19 and 20 June, weather permitting. It is hoped that this expedition will give many stations the opportunity of working into an area where there is not normally much microwave activity.

The 1·3GHz station will be operated by GI8DMX, while the 10GHz station is being provided by GI8GJX. They are very keen to hear from anyone wishing to arrange skeds, and are both QTHR. A 144MHz station will also be operational, using the club callsign GI4KKK, and this can be contacted during the expedition to arrange microwave skeds.

2·3GHz eme tests

Following the arrival of a new crystal for their 2·3GHz converter for 2,320MHz, G3WDG and G4KGC arranged a 2·3GHz eme test with the DJ4AU group. Using the (appropriate!) callsign DF0EME, the DJ4AU group transmitted for 1h, with G3WDG and G4KGC listening. Signals were heard almost immediately, and were the first signals heard on 2,320MHz at that QTH. They were copied throughout the test at a reasonably good level (approximately 1–2dB s + n:n in a 500Hz bandwidth).

The equipment in use at DF0EME consisted of a klystron pa delivering 500W of rf, and a 30ft dish with linear polarization. G3WDG and G4KGC used their 13ft eme dish with a circularly polarized feed horn, and a 2dB noise figure receiver.

DF0EME's signal was of similar strength to the moon "beacon" on 2,276·0MHz, so anyone able to receive this would also be able to receive eme signals from DF0EME.

DX on 10GHz

The good tropo conditions during March and April gave rise to some very interesting contacts on 10GHz. On 27 March, G3LQR worked the following stations on narrowband: PA0EZ at 260km; PA0CRA at 240km; PA0JME; and PA2DOL. G3LQR was also heard by PA0DBQ, who at the time was using an indoor antenna beaming through a block of flats! On 1 April, G3LQR worked PA0EZ for a second time, and on 18 April received very strong signals from PA2DOL, who runs 18W output from a twt.

G3LQR has also heard two beacons from Holland on 10GHz—PA0MS/A on 10,368·04MHz, and PA0DBQ, which runs 20mW output on 10,368·00MHz. The equipment in use at G3LQR consists of a 2ft 6in dish at 45ft on a Versatower, with the 10GHz equipment mounted on the back of the dish.

G3JHM was also able to make good use of the openings. He heard the Alderney beacon while operating portable from Butser Hill. This is the first time this has been heard in 1982—it is comforting to know that it is still on the air. He also gave F1CIK/P his first G-QSO, over a 152km path. The weather at the time was very foggy, and the signal exhibited deep fading.

1·3GHz activity

Activity levels on 1·3GHz have been steadily growing over the last few months, with the Tuesday night activity periods, spells of good conditions and contests all helping to generate and sustain these levels. In particular it is pleasing to note that activity in the north of England is growing substantially. For example, the following stations are known to be operational: G3MMK (ZN11d—West Yorks); G3LRP (ZN33b—West Yorks); G4CCH (ZN48h—South Humberside); G8VRJ (ZN57j—Lincs); G8RYK (ZN74g—Notts); G4KCT/G8SFI (ZN05c—North Yorks); G3HHD (ZO65h—North Yorks); G8PNN (ZP52d—Northumberland); and G8PWX (ZP73d—Tyne & Wear). Most or all of these stations are also active on 144 and 432MHz, and are very willing to arrange skeds.

G4KCT reported that he has a regular sked with G6FK (Wolverhampton) on Mondays at 8.45pm, and Thursdays at 8.30pm. They call initially on 1,296·200MHz, and generally QSY 10kHz up or down depending on activity.

The writer would like to hear from any other active 1·3GHz stations in the more "remote" parts of the UK, particularly from the West Country, Wales, Scotland and Northern Ireland; and from Eire.

Waveguide suppliers

Obtaining waveguide and flanges in small quantities can often prove difficult for the amateur. Readers may therefore be interested to learn of a new supplier—Earth Stations Ltd, 22 Howie Street, London SW11 4AR, tel P. Prior, 01-228-7876. The company keeps a stock of waveguides to cover the range 2–70GHz, as well as the corresponding flanges (usually the plain square brass variety). Other stock items include 4ft and 6ft aluminium dishes.

Getting started on microwaves

The writer has been receiving an increasing number of letters from readers requesting basic information on how to get started on microwaves. What follows is an attempt to provide this information. Probably the easiest microwave band to start on is 1·3GHz, since commercial transverters and antennas are readily available (see *Amateur Radio Operating Manual*, 2nd edn, p73). However, if the main desire is to build some or all of the equipment oneself, then undoubtedly 10GHz is the easiest band, and has the great attraction of being very different from the lower bands, both in terms of equipment and operating practice. It is difficult to generalize on the best way of getting started on 10GHz, but there are some points that can be made.

Wideband equipment is far easier to build and get working than narrowband equipment. A wideband 10GHz station consists of a number of building blocks. The rf source can be either a klystron or a Gunn oscillator. The former device used to be very popular, because it only required the provision of a heater supply, a +300V supply, and a variable negative supply to generate rf. Nowadays however, the availability of good Gunn oscillator designs, and indeed complete Gunn oscillators at low cost, means that this is the currently preferred approach of almost all constructors.

The next most important building block is the waveguide system for the receiver and transmitter. The simplest system uses a commercial "surplus" Gunn oscillator (usually of Mullard or Plessey manufacture) which has a built-in mixer diode. Such oscillators are mainly produced for intruder alarm use and can often be obtained on the surplus market, or new from various suppliers, including RS Components. Their operating frequency is usually just above the amateur band, and they can be moved into the band by the adjustment of a screw.

A slightly more ambitious approach, which offers somewhat better performance, is the "throughline" transceiver, in which a Gunn oscillator is used together with a separate mixer assembly, located between the oscillator and the antenna. The most efficient system is to use a directional coupler-based transceiver, but the extra work involved and the marginal improvement gained does not really make this worth the effort for the beginner.

Three other units are necessary to complete the transceiver. These are an i.f. amplifier, a power supply/modulator for the Gunn oscillator, and an antenna. One question which is frequently asked is what frequency to use for the i.f.. There is no clear answer to this, but commonly used frequencies are 10·7MHz and around 100MHz. The latter is often used because the simplest i.f. amplifier to use is a broadcast fm radio. The bandwidth of these receivers is ideal (about 250kHz), and in conjunction with an extra i.f. preamplifier, they can be very efficient. A disadvantage is that when operating portable from hilltops, breakthrough from broadcast stations and public service transmitters can be a nuisance. For the home constructor, 10·7MHz is probably a better choice, as the Mullard 10·7MHz i.f. modules (advertised in *Wireless World*) form a very straightforward basis for a receiver. All that is required is some additional gain from a preamplifier.

Gunn diode power supply/modulators provide an adjustable stabilized voltage (around 9–10V) for the Gunn device, which can be modulated with either speech or a tone. The latter is a necessary feature to provide an audible signal when signals are tuned in.

Antennas for 10GHz are almost always horns or dishes. Horns are by far the easier to make and can offer useful gains. Dishes provide more gain and are useful over longer paths. Dishes used to be very difficult to obtain, but are now available at low cost from *Practical Wireless*.

Operating practices on 10GHz are very different to those on the lower bands, because antenna beamwidths are very much narrower, and the paths which can be covered with simple equipment generally have to be line-of-sight.

Unfortunately, few articles have been published describing complete 10GHz equipments. The *PW* "EXE" is perhaps the most complete design

*46 Windsor Close, Towcester, Northants

available. However, there is a great deal of information available about the various building blocks described above. The list of references to *Radio Communication* articles below has been compiled by G4KGC and G4CNV to help the newcomer find the most important information regarding equipment construction and operating practices. The microwaves chapter of the *VHF/UHF Manual* is also a very useful source of technical material and background information.

There are a number of microwave meetings held annually, details of which will be published in this column. These are a very good way of obtaining first-hand information and components. The *Microwave Newsletter* (available at £4 per annum) from the general manager at RSGB HQ) also carries much useful technical information and operating news. Listening on 144·330MHz during the 10GHz cumulative contests (see "Contest calendar" for dates) will give the newcomer an idea of the local activity.

Microwave bibliography

CONSTRUCTION	*Rad Com*
Throughline 10GHz transceiver	June 1978, p492
G8APP Gunn oscillator	Feb 1976, p123
Directional coupler transceiver	Oct 1973, p692
G3JVL narrowband transceiver	Jan 1979, p41; Apr 1979, p342; Apr 1980, p372; Feb 1981, p146
Self calibrating wavemeter	Feb 1973, p106
High-Q wavemeter	Apr 1973, p261
Simple crystal-controlled signal source	May 1976, p352
Horn design	Feb 1972, p81; Apr 1972, p229
Dustbin-lid dish	Mar 1976, p194
G4ALN dish feed	Oct 1976, p757
G4COM receiver alignment aid	Jan 1976, p36; May 1979, p424; Sep 1979, p832; Oct 1979, p934; Feb 1980, p155; Mar 1980, p270
A simple method of microwave frequency measurement	Jan 1982, p34
Also	
I.F. preamplifiers	*VHF Manual* 3rd edn, p837

OPERATING	*Rad Com*
Path plotting	Mar 1981, p241
Performance of equipment over line-of-sight path	May 1978, p413
Calculating bearings and distances from ngrs	Sep 1980, p909
"Take to the hills"	Jul 1972, p436
Aligning antennas accurately	Nov 1980, p1164
Sighting compass	Feb 1981, p147
Polarization	Aug 1978, p698
Super-refraction	Jun 1977, p453; Oct 1978, p867; Nov 1978, p951
Enhancements	Nov 1979, p1044
Tropo openings	Mar 1980, p270; Apr 1980, p382
Fixed operation using passive reflectors	Jan 1981, p47

RSGB NATIONAL VHF CONVENTION 1982

(Continued from page 505)

During a very pleasant evening a good meal was served and several awards and contest trophies presented. The main attraction, however, was undoubtedly the opportunity for exchange of reminiscences, ideas and plans between those of like mind.

Postscript

In a smooth-running event, as this year's convention undoubtedly was, the frantic behind-the-scenes organization usually remains invisible to the visitor, as indeed it should. Just because this activity goes un-noticed does not mean that is is unappreciated, and there are a few names which should be mentioned.

Members of the Echelford ARS again did a fine job on the talk-in station, under the leadership of G4NNS. The staff of Sandown Park worked hard and well, and the management were extremely helpful. Members of the Exhibition & Rally Committee, in particular G3MVV, were responsible for most of the exhibition organization. Most of all, however, much credit must go to Geoff Stone, G3FZL, who has masterminded the operation for some years now, and in 1982 gave us the best convention ever.

Next year's VHF Convention will again be held at Sandown Park, on 19 March. To help maintain the high quality of the event the VHF Committee would like to hear your comments and suggestions, no matter how trivial. They should be addressed direct to G3FZL, QTHR.

RAYNET

G. Cluer, G4AVV*

REPORTS FROM GROUPS THIS MONTH include one from Warwickshire Raynet which was called out by the county emergency planning officer earlier this year to man the county control and to provide two mobiles at the village hall in Binley Woods to provide communication for the Social Services department. The village hall was used as a rest centre for people who had been evacuated from their homes because of a gas leak, but the incident passed quietly and Raynet were soon able to stand down. More reports have been received from the Devon groups about their involvement during the poor weather conditions last winter, and details can be obtained from G4DHQ. The South West Dyfed group reported on its involvement at the scene of an oil tanker fire at Milford Haven.

Among the reports of successful operations is a rather worrying one from a group which had real problems with interference on one of the recognized Raynet frequencies on 144MHz during a genuine emergency on the Mendip Hills. Please do all you can to keep clear of Raynet traffic on 144·775–144·875 and 145·2, 145·225 and 145·8MHz.

Full details of these incidents should be held by all Raynet controllers to whom they have been passed by RSGB HQ. All such incidents should be notified to RSGB HQ on the report forms issued to controllers.

How to join Raynet

Amateurs wishing to join a local Raynet group are invited to write to RSGB HQ for details about the organization and the name and address of the local zonal representative who can put them in touch with their local group. You do not normally need to be licensed to play an active part in Raynet.

If you want to go one stage further and form a Raynet group, then the committee would be delighted to help you get started. There are still far too many areas of the country where there is no active Raynet group. However, there have been some problems with groups forming and not registering with the Raynet Committee. To save confusion contact your zonal representative at an early stage and he will help with the paperwork and ensure that these problems do not arise. In particular you are reminded that Raynet controllers only become recognized once their nomination has been ratified by the Raynet Committee. Nomination forms can be obtained from Raynet zonal representatives or from G8CAC, QTHR. Full details on how to form a Raynet group are published in the Raynet manual available from Mrs J. Balestrini, "Merrivale", Willow Walk, Culverstone, Gravesend, Kent; price £1.07.

Representation

The Raynet Committee is unique among RSGB committees in that, as well as representing an interest within amateur radio, it also represents a body of members. For this reason the committee is composed of a number of elected zonal representatives as well as some members appointed by RSGB Council in the normal way. The first-ever meeting of this full committee was held recently, and a number of points were raised and discussed. Details of this meeting can be obtained from any of the zonal representatives listed below.

Zone	Representative
1. Northeast England	Mrs S. B. Jebb, G6AJF
2. Yorkshire/Humberside	I. Shaw, G3KWT
3. East Midlands	G. Griffiths, G3STG
4. East Anglia	J. A. Birley, G3PYN
5. Greater London	W. R. Andrews, G3LRE
6. Home Counties/Southeast England	R. P. Jeffries, G4KAR
7. Southwest England	W. J. Colclough, G3XC
8. Wales	S. J. Brennan, GW3ZXI
9. West Midlands	D. J. Lankshear, G3TJP
10. Northwest England	D. F. Digby, G8DHQ
11. N. Ireland	J. T. Barnes, GI3USS
12. Scotland	D. E. Garrington, GM3RFA

The other committee members are:

Brian Goddard, G4FRG (chairman)	Graham Cluer, G4AVV (publicity)
Mrs Joan Heathershaw, G4CHH (secretary)	George Jessop, G6JP
Ron Bassett (minutes secretary)	Basil O'Brien, G2AMV
Mike Barker, G8CAC (group information)	Henry Pinchin, G3VPE

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SWL NEWS

Bob Treacher, BRS32525*

March slp report

Paul Crankshaw, BRS48909, has sent his report on the first two set listening periods held at the end of March on 7MHz. The fact that the WPX SSB Contest coincided with the ssb slp meant that there was no shortage of stations to be logged. In all, 45 different countries in five continents were logged during the ssb event. The best dx logged included CN8CO, FG0DYM/FS7, KL7U, NP4A, SM0GMG/CT3, TI2LO, VP2EC, ZL4BO, 6W8JX and 6Y5HN. The results were as follows:

			Stations worth			
Posn	Station	Countries	15pt	10pt	5pt	Total Score
1	BRS25429	34	9	13	60	19,210
2	RS46228	29	10	26	44	18,270
3	BRS48909	27	6	8	35	9,315
4	BRS29909	21	7	13	20	7,035
5	ARS45717	23	7	2	36	7,015
6	BRS47285	26	5	1	36	6,890
7	BRS50134	21	6	5	28	5,880
8	BRS49802	18	6	1	43	5,670
9	BRS48675	13	2	0	19	1,625

The cw event prompted two entries, and 21 countries were logged. The best dx was PY1DMQ and VP8ANT. Scores were as follows:

			Stations worth			
Posn	Station	Countries	15pt	10pt	5pt	Total score
1	BRS44395	15	1	1	37	3,150
2	BRS29909	16	1	2	24	2,480

One amendment for future slps will be that the requirement to log the report given by stations heard will be dispensed with. A number of reporters felt that this information was superfluous, as the object of the slps is to log as many stations as possible as a means of monitoring propagation conditions.

A reminder that the next slps will be on 19 June on 21MHz ssb from 0900 to 1100, and on 20 June on 21MHz cw from 1700 to 1900. Logs should be sent to Paul Crankshaw, 20 Reedloch Drive, Barassie, Troon, Ayrshire KA10 6UU.

All-time table

As more listeners reach the magic 750 mark for entry into the all-time table, the time has come to say "73, BCNU" to the licensed members who have added an extra flavour of competition to the table for the past two years. However, the good news is that G3GIQ will be running an all-time list in G3FKM's *MOTA* feature. This will appear quarterly, starting in September, to coincide with the appearance of the swl table. Those who wish to compare scores will, therefore, be able to continue doing so. Your scribe would add a word of thanks to those licensed members who have actively participated in the table. It was a pleasure to receive those scores from them. Hopefully, G3GIQ's table will be as successful as the one it copies!

Newcomers

Andrew Smith, RS50134, wrote from Guernsey. He had been listening for just over one year using a Grundig 1400 Satellit with only its telescopic antenna. One drawback is that this receiver does not cover 28MHz. However, he had copied signals from 219 countries, but had not sent any QSL cards. Andrew wondered whether any of the vhf scanning receivers on the market had an ssb capability. Unfortunately not. The solution is to purchase a converter, to use in conjunction with an existing hf receiver, details of which he could get from one of the advertisements in *Rad Com*. They are reasonably priced and will get the set on 144MHz in time for the up and coming dx season on the band. Converters can also be purchased for 70 and 432MHz.

Stephen Bowler, BRS46105, had been an swl for 14 months when he wrote. He has a Trio R1000 receiver and a G4MH mini-beam, plus a five-band vertical. Currently practising his cw reception with the help of a morse tutor, Stephen already has 140 countries confirmed, 95 per cent of them direct, using the *DX Callbook*.

Paul Hardwick, BRS47233, has been a member of the Society since May 1981. He started serious listening when he purchased a 9R59DS receiver, and has a homebrew atu and a long wire which enable him to tune 21 and 14MHz, his favourite bands.

Dennis Marriott, BRS50367, recalls that his interest in the hobby started because he became bored with tv. He too purchased a Grundig 1400 receiver, but soon developed more interest in the hobby and bought a Trio R1000. He reported a 100 per cent success rate on the QSL cards he had sent up to the time he wrote, but he had only sent reports to Gs. His son Gary has caught the bug too, and starting in September they are both going to study for the RAE.

Dick White, BRS46701, was an swl many years ago, but recently rejoined the Society. Some of the more exotic QSL cards from Dick's earlier stint as a listener were from Tangier (EK1), Tunis (FT4), and a British Forces station in Palestine (ZC6)—all of course long since extinct as amateur prefixes. He is another who now uses a Trio R1000 receiver into a KX2 atu and a 100ft long wire.

All-time countries list

(starting score 750)

Station	28	21	14	7	3·5	1·8	Total	Mode
G3KMA	311	325	326	275	198	63	1498	ssb/cw
BRS32525	267	301	317	239	246	53	1423	ssb
BRS25429	270	305	329	233	223	59	1419	ssb
G3GIQ	303	322	323	190	154	41	1333	ssb/cw
RS42604	277	286	273	234	178	50	1298	ssb
G3MCS	298	310	313	178	166	21	1286	ssb/cw
A8841	240	274	309	181	173	25	1202	ssb/cw
A8808	238	274	293	161	163	53	1182	ssb/cw
G3ALI	206	234	301	168	189	0	1098	ssb/cw
G4FAM	230	244	246	193	130	37	1080	ssb/cw
BRS28198	203	198	257	166	165	36	1025	dm/ssb
G3XTT	231	220	198	171	133	56	1009	ssb/cw
BRS48909	199	232	236	142	98	30	937	ssb
BRS1066	179	194	259	145	94	58	929	ssb/cw
BRS44703	183	186	205	144	128	36	882	ssb
OE2VEL	172	219	260	116	105	9	881	ssb/cw
RS46228	141	153	213	180	119	36	842	ssb/cw
BRS30694	154	226	243	103	69	29	824	ssb/cw
BRS47745	162	175	176	120	109	32	774	ssb
BRS31440	166	166	207	99	91	31	760	ssb

1982 countries list

Station	28	21	14	7	3·5	1·8	Total	Mode
BRS47745	159	167	169	112	108	29	744	ssb
BRS8841	161	140	185	109	86	14	695	ssb/cw
RS46228	115	108	170	134	107	32	666	ssb
BRS44703	117	107	129	104	98	25	580	ssb
BRS1066	90	101	113	79	62	40	485	ssb/cw
BRS31440	118	85	106	74	67	27	477	ssb
ORS45992/7Q	111	153	153	23	5	0	445	ssb
BRS35509	86	45	103	56	65	2	357	ssb
BRS48675	64	79	91	49	36	18	337	ssb
BRS30493	34	61	96	36	25	6	258	ssb
BRS30694	40	28	73	36	44	21	242	ssb/cw
BRS45466	36	32	47	39	50	16	220	ssb
BRS25429	0	0	0	99	85	25	209	ssb

VHF

As we, hopefully, enter the summer, conditions on the vhf/uhf bands should improve. The column will reflect the good conditions and the dx heard, as long as someone reports the openings! Remember that on vhf not everyone experiences the same conditions, so as many reports as possible please to give the broadest possible picture.

The March contest was fairly ordinary. CI square seems to have been the

The receiving station of Stephen Bowler, BRS46105

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best dx heard on 144MHz, while on 432MHz stations in North Yorkshire were audible during the Sunday afternoon.

One occurrence of note—the aurora on 144MHz on 10 April. Dave Whitaker, BRS25429, caught the conditions from ZN03h. GI, GM and GW were heard, plus one lone German in EO square. The following found their way into Dave's log: DK1PT/P, GI6BNI, GI8YWV, GI4GVS, and GM6CEN, who gave Dave XR square for the first time. 144MHz QSLs reported from various sources were DG8NAQ, FJ56h; DK2EA, FK69a; DL4FAC, EK64h; OK1AFN/P (3W to a 16-el Tonna at 736m asl), IK52a; and OK3RMW/P, GJ46e (25W to a 10-el Yagi at 800m asl).

Band reports

Nothing to report on the 10MHz front. After a brisk start activity and news of the band have diminished. However, on the other bands dx was quite forthcoming during April. The highlight was undoubtedly the appearance of BY1PK from China, and listeners can hope for far greater activity in the near future. On 1·8MHz, activity had centred around the now familiar dozen or so callsigns that adorn virtually every report your scribe receives. No really exotic Caribbean dx was reported during the WPX event, but EA8QL and 4N0SM (YU) were noted. The 3·5MHz band was preparing for its customary summer slumber. The QRN level usually renders late night dxing impossible during summer months. However, the best logging for some was VK9NS, which still eludes your scribe on 3·5MHz. Luckily, Jim should still be as active during the 1982–83 winter dx season. European dx mentioned was DF1KK/ZB2, FC6FPH and the Navassa trip—KP2A/KP1 and 6Y5MJ via K8ZBY.

7MHz was only open for morning dx until 0600, mainly due to the change from gmt to bst. In the evenings JAs had been reported at 1815, while VKs were heard around 2030. Other dx included A92P, CO2HT, J73PP, S79DF and DJ6SI/3X. The higher bands all seem to have produced something in the way of dx. Among the more choice stations reported were—**14MHz:** FB8ZQ, FK8DD, FO8HG, I8QO/TT8, T32AB via N7YL, WB0MKR/KH3, and ZM7VU. **21MHz:** BY1PK, FR7ZN, J5HTL, TN8AJ, XZ9A, ZK1CG/North Cook, and 9V1TS. **28MHz:** FH8CL, H5A1R, KB7IJ/KH2, K6GXO/V2A, VK9NNB, and 4X2BYB via WB2WOU. Only cards for G3UML/4X should go to G3UML.

QSL cards which were reported from a number of sources, included FB8WG, FK8DV, KH3AB, OX3AH, SU1ER, T32AB, VK9XT, 3X1Z and 9N1MM. Brad Bradbury, BRS1066, mentioned 1A0KM for No 276 confirmed, and Dave Whitaker has cards from OE2VEL's Pacific expedition for T2VEL, T30BF and ZK2EL, all on 7MHz, taking his confirmed total for the band to 220.

Chatter

A reminder that the RSGB QSL Bureau is closed until 13 June. Please do not send outgoing cards to G3DRN until after this date.

The May column quoted the QSL manager for 4K1A as UA3XBP. It seems the correct route is in fact via UA3AEL. Apologies for the wrong information, which was in fact from a normally reliable source.

Steve Muster, BRS47745, had started to QSX to cw transmissions during evening hours. His new Yaesu FRT7700 and 50ft long wire were performing well and had a great deal to do with his rise up the 1982 table.

D. Clanarchan, RS47687, wrote to confirm that following his RAE pass, the Orkney Is would have another active amateur as soon as he could save the necessary pennies to purchase a 144MHz transceiver. He will, hopefully, confirm all swl reports for Orkney, YS square, which is certainly sought after for the FMD and 4-2-70 awards.

Archie Magrath, RS48064, had been encouraged by the steady stream of QSL cards received in April: FR0FLO, HV1CN, JY9RC, 4Z4ZB, 8R1J and 9X5SL all obliged.

Colin Watson, BRS46598, passed on details of the Canadian Amateur Radio Federation (CARF) News Service. It puts out a bi-weekly radio bulletin using the callsigns VE2TCA and VE3TCA. As the stations close down until the dx season commences in September, your scribe will hold over the operating times and frequencies until then.

Stan Porter, ORS45992/7Q, had applied for several awards, and reports them arriving slowly but surely. He has formed a club out in 7Q-land, and when he wrote it had two members-ORS46084 and himself. Stan thanked the six members who wrote offering to help with spares for his CR100/2 receiver. He has no doubt been in touch by now.

Finale

Late news from G4LVH to any listeners who need a card for a GB2 prefix. GB2UW will be active daily until 25 June. QSL cards should go to PO Box 146, Cambridge.

News, comment and table scores for **August** should reach your scribe by Tuesday **15 June**, and late news by **23 June**.

BOOK REVIEW

Computers and the Radio Amateur by Phil Anderson, W0XI. First edition, 1982. Published by Prentice-Hall International. 208+xii pages (235 by 175mm). Price £14.20 (hard covers).

This is a positively delightful book. The very first sentence in the preface sets the tone for the whole volume: "The book is written for radio amateurs who have had little or no exposure to computers—how they function and how one programs them and attaches them to other equipment." Never having had the experience of attaching a radio amateur, computer literate or not, to "other equipment" I began to work through the book with eager anticipation. I was not disappointed. Half-way through the second chapter came the revelation that the 20,000 valves of ENIAC, one of the first true computers, consumed "nearly a half-million kilowatts of power". Admittedly circuits in 1942 were not especially noted for efficiency, but 25kW dissipation per device does seem a little bit excessive.

After this the style settles down, with plausible, albeit very scanty and often inadequate, descriptions of "How computers work", BASIC, Assembly language, logic circuits, and interfacing. By the time page 117, nearly two-thirds of the way through the book, has been reached one begins to wonder where the amateur radio bit is.

The answer is in the last third of the book. A chapter each is devoted to programming the computer to be an electronic keyer, a random morse generator, a cw reader, and a "contest secretary". All of the programs are written in BASIC, but here the fun starts again. At least two very different dialects of the language are used, neither of which is quite the same as that described in the earlier chapters. Better yet, throughout the book references are made to the TRS80 computer, a Z80 based machine, but the earlier assembly language description is all about the 6502 microprocessor.

The programs themselves show every sign of having been patched until they work, and then called finished. Subroutines are scattered gayly, and for no readily apparent reason, in the middle of serial code, with clumsy jumps to and fro around them completely obscuring the underlying algorithms. The cw reader is unique in only being able to copy letters, which could be a slight disadvantage given that every amateur callsign contains at least one digit.

The pièce de résistance comes in the final chapter, entitled "The Computer as a Programmable Calculator". A program is presented to calculate the length of a dipole half section in feet from frequency in megahertz. It is quite a simple formula; l=234/f; yet the program manages to occupy a full 19 lines!

Overall, the complete newcomer to computing is likely to find this book confusing and annoyingly incomplete. It tries to cover too much material in too short a space and ends up being superficial. The more experienced reader who is able to fight his way through the inconsistencies and errors may find one or two of the flowcharts interesting. *G4ANB*

Looking ahead

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

19 June – RSGB HF Convention, Belfry Hotel, Oxford.
11 September – Scottish Amateur Radio Convention & Exhibition, Aberdeen.
9 October – Midlands VHF Convention, Wolverhampton Polytechnic. Details from J. P. H. Burden, G3UBX.
14-16 October – 11th ARRA Amateur Radio Exhibition, back at Leicester this year.
4 December – RSGB AGM, IEE, Savoy Place, London.

THE MONTH ON THE AIR

John Allaway, G3FKM*

COMMENTS MADE BY John Lindholm, W1XX, in March *QST*, concerning a paper from the RSGB which was presented to the recent IARU Region 3 conference have been noted by a number of members, and it seems appropriate that comment is made and the document in question reproduced in *MOTA*.

Paper 82/V/08 had already appeared on the agenda of the Region 1 conference in 1981 at Brighton as BM/33. It was prepared by the HF Committee and enabled discussion to take place on the desirability (or otherwise) of changing the current format of signal report codes. The matter had previously been raised in print in *Radio Communication* (August 1979), *CQ-DL* (January 1980), *QST* (July 1980) and *Ham Radio* (September 1980). The paper reads as follows:

Proposal

(a) The tone (T) part of telegraphy reports should be abolished.
(b) The definitions for "subjective" signal-strength reports on both telegraphy and telephony should be simplified to:

S1 barely perceptible
S3 weak
S5 fair
S7 strong
S9 extremely strong

Comments

1. T reports should be abolished because:
   (i) Nowadays nearly all transmissions are T9 due to the use of commercial equipment.
   (ii) The present system is not being used properly. Poor tone, chirps, and key clicks are not usually reported, either to be polite or to reduce transmission time. It would therefore be better if reports on signal quality were optional, as is already the case on telephony.
   (iii) Telegraphy and telephony reports would then be made the same way (readability and signal strength).
2. The "subjective" signal-strength definitions should be simplified because:
   (i) Nine possibilities (although practical with S-meters) are too many for reporting by ear alone.
   (ii) The existing definitions are too vague. For example, it is difficult to decide by ear if a signal is "fairly good" (S5) or "moderately strong" (S7).

Five possibilities (as used by other services) are much easier to use and mean that the definitions can be made clearer. It is proposed that they should correspond to the odd S-numbers; this ensures complete compatibility with the use of S-meters in the amateur service.

Note that the problem is complex and no possible decisions can be taken without *worldwide* international agreement. Hence the discussions in all three IARU regions. The topic is likely to be talked about for a long time. The writer does not hold strong views on the matter—do you?

Sincere apologies to G3UML, whose callsign and score were omitted from the DXCC listings in April *MOTA*. Laurie's totals are 332/312.

The Cambridge University Radio Society is celebrating its 50th anniversary and will be on the air this month with the GB2UW call. Their recent operation from Jersey as GJ6UW resulted in over 5,000 contacts as well as another 2,000 by the operators using their own callsigns.

G3XBY, QTHR, would appreciate help in tracing the operators of MP4TCE (Michael–January 1969), MP4TDA (Ray–September 1969), and MP4TBH (April 1969).

Licensing in the Federal Republic of Germany

Information received from DARC indicates that the procedure for the composition of callsigns for visitors to the FRG has been changed and now accords with the IARU Recommendation accepted at the Region 1 conference in Hungary in 1978. Visitors will generally have to use their home callsigns preceded by the relevant prefix, eg DL/, DH/ or DC/ depending on licence class. The range of frequencies available to Class B licence holders (the highest class) now includes all three new WARC hf bands, 10, 18, and 24MHz, A1A only. It is also announced that a reciprocal agreement has now been signed between Australia and the Federal Republic.

Licensed foreign radio amateurs staying temporarily in the republic may now apply for a short-term amateur licence from the Deutsche Bundespost (valid for three months) by directing their application (at least six weeks in advance) to DARC, International Affairs, Postfach 1155, Baunatal 1, Federal Republic of Germany. The licence fee (DM15) should be transferred at the same time that the application is forwarded to DARC by postal money order (no stamps or ircs) to: Postscheckkonto No 5613-430 at Postscheckamt Essen, BLZ 360 100 43, for DARC International Affairs, D-3507, Baunatal 1. A German licence will only be granted if the applicant possesses a valid licence for his own country. Further details of information to be sent to DARC etc, is available from RSGB HQ.

Expeditions

Lloyd and Iris Colvin, in a letter dated 1 April, said that they had concluded operation as W6QL/PJ2 after making 9,000 contacts with amateurs in 148 countries, using all bands including 10MHz. They lived in a small house belonging to PJ2CZ, and PJ2MI (who is in charge of amateur licensing) had licences ready. The Colvins returned to the USA from Curacao after an absence of six months, during which they had made 56,000 QSOs from 8P6QL, 9Y4KG, W6QL/8R1, W6KG/PZ1, FY0FOL, and W6QL/PJ2 in four months "on the air" time. All QSL requests should go to the YASME Foundation where W6RGG, WA6AKK, W6BSY, W6TUN and K6CCY are working on the replies. Further operations are planned for later in the year, and Iris and Lloyd thank all for their continued support.

More information is now to hand concerning the SM0AGD Pacific trip. This month the *Marathon AQ* should reach Tokelau from North Cook Is, and in July some T31 (C. Kiribati) and KH1 (US Phoenix Is) operation is expected. Later calls will be made at T30, T2, FW8, A35, ZL and VK, and in 1983 the itinerary will include Willis Is, Mellish Reef, Solomon Is, Nauru, the Caroline Is, and even possibly Spratly en route to the Indian Ocean. The equipment will be an IC-730, TR7, and GLA-1000B. Antennas consist of a triband Yagi beam for 14, 21 and 28MHz, and a vertical for the lower frequency bands. QSLs should go to SM3CXS (see "QTH Corner") and separate envelopes are requested for each operation. The whole expedition is being organized by the Sundsvall DX Group, and aided by the Northern California DX Foundation.

Overseas news

GI4JJD has kindly supplied a copy of *Radiovaticana Programmes 82* which contains information on HV1CN, HV2VO and HV3SJ. It points out that amateur radio is not just a hobby but a way to communicate with others across borders of every kind. HV1CN has now been active since 1957 and still uses the equipment donated by Bill Halligan of the Hallicrafter company when the station opened. The station is on the top of the building which houses the original studios of Vatican Radio. HV3SJ is on top of the Jesuit generaliste, and HV2VO at the Vatican observatory in the grounds of the Pope's summer residence at Castel Gandolfo.

Don Radley, G4ABI (ex 9G1GE and 9J2GE), is now active from Connecticut as G4ABI/W1. This is after a period of six years off the air when he was in Greece and Dubai and unable to obtain a licence in either country. He would appreciate contacts with old friends in the UK, Zambia and Ghana.

Dick Dorrance, PP2ZDD, a winner of the overseas section of the 21/28MHz Telephony Contest; he was W2LEJ before retiring to Goiania, Brazil. His antenna consists of a TH6DXX at 65ft

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Vince Lear, G3TKN, is working in Sydney for a year and on the air as VK2EAO. He runs an FT707 with delta loops on 14 and 21MHz, and dipoles (inverted-V type) on 3·5, 7 and 10MHz. Operation is mainly cw. Vince notes that 7MHz is much quieter than in Europe, and that 10MHz is very reliable into Europe with little interference. An interesting observation is that he can often hear GM3PPE for one hour after dawn in VK while his own signal fades away in the UK an hour earlier. He will be on 3·5MHz cw looking for Europe.

Alf Wilson, G3PGG (ex-EP2TW/ZD1AW), lives in Cairo and points out that the QTH given for SU1ER in March *MOTA* contains an error. The word "Airpost" should have read "Airport". Apologies from your scribe for any inconvenience caused. Alf is still hoping to obtain an SU call, but this is very difficult.

A letter has also been received from G4KHB, who passes along a message from SU1ER to say that his callsign is being pirated, and that YU1OFY is being given as QSL manager by the pirate. As has been stated before, SU1ER requests QSLs direct and he confirms that this is the only route for all SU stations. They are all correct in the 1982 *Callbook*.

All-time countries table

It is proposed to commence an all-time countries table for the seven high and lower frequency bands, similar to that appearing in "SWL News". This will appear once every three months and stations will be listed in order of total score. The rules are as follows:

1. Entrants must have had at least one contact on each of the seven bands.

2. The minimum total to enter the table is 750—however, entry will also depend on the space available.

3. To remain in the table, score updates must be received at least once every six months.

Those wishing to participate should send their seven-band score to G3GIQ, *QTHR*.

Welcome

The following joined the Society from outside the UK during March: A92NH, EA6ET, EI9EH, F5PM, HE9UCF, LA4ND, ON1KDG, SK2GJ, SM3AKW, SM6JXV, VE4AG, VK4AAB, Z21GL, 9J2DA and 9J2TJ. Listener new members included J. Claughton (DL), J. Beckert (DL), M. O'Dea (EI) and G. Little (W8).

DX news

Anyone needing confirmation of a contact with 5W1BZ between July 1978 and November 1980 is advised to apply to ZL1AIZ at the address listed in "QTH Corner". Alternatively QSL to ZL1AIZ via NZART QSL Bureau, cards sent to West Samoa will be much delayed. All QSLs received from 5W1 or via ZL1AIZ's old QTH have been answered, as have 1,500 cards received via the bureau.

TL8CK and TL8GA have been heard between 2200 and 2300 on 21 and 28MHz ssb. 5R8AL should be back in Malagasy by the time this is being read. Before going on leave, Alain was being reported on 7,002kHz around 1530, and on 21MHz ssb at various times between 1600 and 1900.

ZD9BV keeps a schedule with ZD8TC at the time of writing—at 1700 on 14,140kHz. He may also be found on Mondays between 1600 and 1900 on 14,225kHz, and on Tuesdays, Thursdays and Fridays between 1800 and 2200 on 21,338kHz. Other frequencies to watch include 21,388kHz and 28,620kHz. Further schedules with ZD8TC are reported to take place on Tuesdays, Thursdays and Sundays at 1830 on 28,620kHz, and Ted is said to make lists of Europeans wishing for contacts at 1800. The situation is somewhat confused, and the *DX Bulletin* reports that Andy has lists made at 1800 on either 21,377kHz or 28,940kHz (perhaps for USA only?) for action at 1900 on whichever band the list was made. Intensive listening seems to be the only answer!

FB8WG is another station whose activities appear to be centred around the formation of lists. Much unhappiness has been caused by this activity and much ill behaviour generated around the frequencies used. However, he has been worked in the UK on 28,450kHz around 1300, and has also been heard in the YO3KWJ net on Mondays at 1230 on 28,510kHz. George should be on Crozet Is until September.

LA1RR/ST0 keeps a schedule with K4MZU on Monday or Tuesday at 1400 on 14,260kHz. He has also been worked on 14,215kHz at 0430, and later on 28MHz ssb.

QSL cards for contacts with 6O1TI, T5TI and T5MA are now being accepted for DXCC credit.

5V7HL is often to be found on 14,285kHz on Wednesdays at 2200, and on Sundays at 2100. He has also been heard on 28,600kHz around 1800, and on 21,340kHz a little later.

QTH CORNER

BY1PK	PO Box 6106, Beijing, China.
C31YG	G5YC, Imperial College RS, Imperial College Union, Prince Consort Rd, London SW7.
CE0DFL	via CE3YY, S. L. Mongillo, Fuente Ovejuna 1425, Santiago, Chile.
CR9BK	via JA1HGY, Nao Mashita, 8-2-4 Akasaka, Minato, Tokyo, Japan.
J20Z	via F6ATQ, J. Cassaro, 322 rte nationale de St Antoine, 13015 Marseilles, France.
WB0MKR/KH3	via KB2RU, E. M. Sirianni, Heather Ridge 326, Mantua, NJ, 08051, USA.
KP2A/KP1	via WB2MSH, H. O. Feltman Jr, 20 Progress Av, Woodbury, NJ, 08096, USA.
KH0AC	via K7ZA, J. O. Zabel, 20711 231st Av, SE, Maple Valley, Wash, 98038, USA.
OE2DYL	Dieter Konrad, Bessarabierstr. 39, A-5020 Salzburg, Austria.
PY0AC, PY0AD	via PY1VOY.
PY0FN, PY0RA	via PY7YS, J. Lins, R. Jose Vilar 280, 60000 Fortaleza, CE, Brazil.
SM3CXS	J. Svensson, Berghemsvagen 11, S-863 00 Sundsbruk, Sweden.
SU1ER	(corrected) Box 33, Airport, Cairo, Egypt.
VK0AB	via VK2BRN, R. Blake, 32 Lynwood Av, Killara 2071, NSW, Australia.
VK0DX	via VK7LJ.
G4ABI/W1	D. S. Radley, 81 Lawson Lane, Cosagmo, Ridgefield, Conn, USA.
ZF2FV	via WD8MRF, D. E. Deeds, 8753 Twp Rd 48, Findlay, Ohio, 45840, USA.
ZL1AIZ	P. B. Lake, 12 Brasenose Place, Tawa, Wellington, New Zealand.
5H3LM	Box 511, M'beya, Tanzania.
ZM7VU	via F6DYG, H. M. Lilienthal, 593a Ronde des Pioutons, Predina 2, 13800 Istres, France.
5W1EB	PO Box 1177, Apia, Samoa.
7P8CI	Box 949, Maseru, Lesotho.

TN8AJ is active again and feeds a kilowatt into dipole antennas. He has been worked on 7MHz cw as well as on the higher frequency bands. QSLs continue to be requested via Y25LO.

7Q7LW is often active on Saturdays from 1530 on 28,515 or 28,690kHz. He has also been worked on 21MHz ssb at 2000.

VK0AB is located at Casey Base, Antarctica. VK0DX is at Mawson Base, also in Antarctica. VK0AN is located on Macquarie Is and keeps a schedule with VK9NS at 0700 on either 14,210 or 7,090kHz; this takes place weekly on alternate bands—the *DX Bulletin* says that the 6 April meeting was to be on 14MHz. Another place to look is the Open House net on 14,332kHz around 1000.

Recent VR6TC schedules with DL8FL have been at 0630 Sunday on 14,140kHz, and 1700 Tuesday on 28,590kHz; Tom has also been a good signal near 14,180kHz around 0800.

Those still looking for Father Moran, 9N1MM, will be interested to learn that he often talks to W3WGS at 2400 on 14,235kHz on Mondays and Fridays. *DX News Sheet* says that QSL manager N7EB has sent out 54,000 QSLs during the past 15 years.

Some Canadian stations have been using special prefixes in the past few weeks. VE1-VE8 stations have been allowed to use VC1-VC8 in order to mark the emergence of the new Canadian Constitution. VO1, VO2 and VY1 stations have likewise been using CY1, CY2 and CK1. The Canadian Constitution Certificate is available to those who can send certified log data of contacts with 10 stations using these special prefixes during the period, plus four ircs, to VE3LSS.

A note in *DX-NL* points out that QSLs for the following callsigns can be obtained from OE2DYL (see "QTH Corner"): OE2VEL/HB0, OE2VEL/KH6, OE2VEL/KH8, OE6BVG/KH6, OE6BVG/KS6, A35EL, A35XX, 5W1DD, 5W1DE, 5W1DO, C21NI (for QSOs 19-23 September 1981), ZK2EL, ZK2TA, T30BF, T30BG, T2VEL, T2ETA, CR9EL, OE1ETA/KH6, OE1ETA/KH8 and VP2ARS (11-17 April 1981).

The activity by 1A0KM is strictly limited and it is believed that the only dates when the station was on the air during 1982 prior to mid-April were 13 and 14 February. HV2VO has been fairly active on 14,310kHz at weekends.

Awards

Principality of Monaco Award

Awarded for confirmed contact with three resident Monaco stations—temporary expedition contacts do not count. They must have been since 1 January 1980, and applicants should send QSLs or photocopies of log entries, plus US $10 or 20 ircs to: Responsable des Diplomes, Secretaire general de l'ARM, 24 Av Prince Pierre, MC 98000 Monaco. Any enquiries should be accompanied by an irc and self-addressed envelope and sent to the Award Manager, ARM, at the same address.

Cork Radio Club DX Award

Available to licensed amateurs and listeners for contacts with members of the club. EI/G stations require four, other Europeans three, and others two. Send log details showing callsigns, names, dates, times, bands and modes used to W. O'Reilly, EI8AU, Mount Oval, Rochestown, Co Cork, Eire. The fee is US $3 or 10 ircs outside Europe, and eight ircs within Europe. Valid stations are EI1s CI, CN, CS, DA, EI2s AD, AJ, BA, CK, CV, DQ, EG, EI3s BB, BF, BK, BV, BW, CA, CB, CE, CV, DP, EC, EF, EG, EI4s BZ, DQ, EC, CE, CR, DF, EI5s I, AG, AL, AR, CD, EI6s AE, AK, AG, AX,

BA, BT, CB, CK, DB, DC, EI7s V, AE, AL, CG, CT, CW, AV, DJ, EL, EI8s Q, AB, AP, AU, DK, DJ, CR, CS, EI, EL, DS, EI9s E, X, W, AB, BY, CH, CZ, DG, EI0s DH, WB1CPJ and W5DL.

Contests

Canada Day Contest

0000 to 2400 1 July

1·8 to 144MHz. Phone and cw. Single-operator single- and multi-band, and multi-operator single-transmitter multi-band sections. There is also a QRP section (5W dc input or 10W p.e.p. output). All contacts are valid and the same station may be worked on each mode on each band. No crossmode QSOs are allowed and band plans must be followed. Exchange RS/T and serial QSO number (from 001). Canadian stations will also indicate their province. Contacts with Canada count 10 points, with other countries one point. Ten bonus points are earned by working any CARF official station using a TCA or VCA suffix. The multiplier is the total of Canadian provinces and territories worked on each band on each mode. Suggested QRGs to operate near are 1,801, 3,525, 7,015, 14,025, 21,025, 28,025, 3,770, 7,070, 14,150, 14,300, 21,200, 21,400 and 28,500kHz. Phone is suggested during even hours, and cw during odd hours. Cover sheets and multiplier check lists are available from the sponsors. Entries should include "dupe sheets, a list of multipliers and calculation of final score. Mail before 1 August to CARF, PO Box 2172, Stn D, Ottawa, Ont, K1P 5W4, Canada.

Third EUCW Fraternising CW QSO Party

1500–1700 19 June (7 and 14MHz)
1800–2000 19 June (3·5 and 7MHz)
0600–0800 20 June (3.5 and 7MHz)
0900–1100 20 June (7 and 14MHz)

European single-operator cw only. Non-members of EUCW organizations are Class C and may use licensed power. Listeners may enter. Exchange RST/QTH/name, and if non-member send "NM". Listeners should log exchanges from both stations. EUCW members will send SCAG, AGCW, GQRP, TOPS, SARS, HSC or CWC. Stations may be worked once on each band. Contacts with own country count one point, with others three. Listeners earn three points for each complete contact logged. Logs should show date, time, callsign, frequency, information sent and received, and points claimed. Enclose summary sheet with name and address, callsign, claimed score and station details (including power input). The G-QRP club will issue merit certificates to the first three stations in each class. Send logs to reach G. Burt, GM3OXX, 1/5 Essendean Terrace, Clermiston, Edinburgh EH4 7HD, no later than 30 July.

Unfortunately, when copying the **1981 ARRL DX Contest** results (see January *MOTA*) multi-operator scores were omitted. In the phone section (multi-operator single-transmitter) **G4KPE** scored 1,495,728 points, **GW4BRS** 982,977, **GM2IA** 527,868, GM4DMZ 329,616, and GW4IOA 75,997. In the multi-operator multi-transmitter class **G4ANT** was world top —but unfortunately the score is not recorded in *QST*. In the cw section multi-operator single-transmitter entries were **GU3HFN** 2,348,064 points, **G4DAA** 2,172,702, **GW4BRS** 898,614, **G3WTM** 753,858, and **G3VFY** 690,039. Special mention also of **G4GIR** who won a plaque as world top 28MHz in the cw section, and **G4BUE** who did likewise as world leader in the QRP section.

Results of the **CQ WPX Contest 1981** (CW section) have been received from W1WY, and UK scores are as follows:

G3FXB	(All band)	1,902,930 points		**G3XOX**	(21MHz)	25,755 points	
GD3TXF	,,	940,555	,,	**G3KDB**	(14MHz)	1,041,925	,,
G3ESF	,,	401,448	,,	**GW3NYY**	,,	43,323	,,
G2AJB	,,	128,100	,,	**G4BWP**	(7MHz)	721,630	,,
G4GIR	(28MHz)	155,856	,,				

Congratulations particularly to **G3KDB** who was world fifth on 14MHz, **G4BWP** who was world second on 7MHz, and **G6UW** who came world eighth in the multi-operator single-transmitter category with 2,614,584 points. Under this heading **G4DSE** scored 2,018,002 points to be European eighth, and **GW4BRS** 1,454,840, and **GM3USL** 205,004 points. (QRP section scores were not in the material received by G3FKM.)

Radio amateur Lions

The International Association of Lions Clubs is the world's largest service organization, and some of its 1·5 million members unite around the world through amateur radio. UK radio amateurs who are also Lions meet on 7,090kHz every Sunday at 9.30am to exchange news and views. The organizer of this net is Lions past district governor Sam Brown, G4ISB, and all Lions are welcome to call in.

B. W. Le Gtys, G3GOT, president of the Lions Club of Witham, Essex, who is a regular participant in the Hunting Lions on the Air Contest

Around the bands

The abnormally early deadline for last month's copy meant that there was no report from G8KG. Happily that situation has been remedied and this month's offering reads as follows: "Solar activity continued to be high during March, with the daily solar flux peaking at 249 sfu on 5 March and again at 232 sfu 12 days later. The monthly mean was 210 sfu, and the geomagnetic field was relatively quiet compared with February—with the result that conditions on the hf bands were generally good, with some excellent days.

"While the progress of the cycle continues to be difficult to predict, it would have been surprising if the recent high levels of activity had continued for many more months. At the time of writing it looks as though April flux values will average about 25 per cent below those for February and March, though it will be some months before it is clear whether this marks the start of a firm downward trend. What does seem reasonably certain is that at the end of this year, which will be three years after the official peak of the cycle, the level of solar activity will still be *higher* than it was at the peak of Cycle 20".

Thanks to the following for logs and information: G2s BON, HKU, G5JL, G3s BDQ, GVV, IMW, KSH, NWG, XBY, G4EHQ, GW4KGR, G4s LDS, LRS, and RSs 30694 and 42876.

Stations listed in italics were using A1A.

1·8MHz. 0500-0600 AA4MM, KR2N, NP4A, W8LRL. **2100** *OY7ML*. **2200** *EA3JJ*, EA6CE, *F6ETO*, LX1PD, *OH5NG, SMs, UL7CAD*, 4N0SM.

3·5MHz. 0300 C53, CY1AF, VE1AI/1, 8P6. **0400** K2FV, **0500** K9s EL, MFY. **0600** K3KG, KP2A/KP1. **0700** NI4H, *ZL1*. **2200** XT2AU.

7MHz. 0500 *CM, CN2AQ, PY1, 2,* and *3, ZS6DN*. **0600** ZL, 9G1GQ. **0700** HR5MVO/HR1. **0800** VP2MCK. **2100** *CN8CY*.

10MHz. 0000 *C6ABA*. **0800** *VK*. **1800** *ZL*. **2000** *VK*. **2100** *VP8ANT*. **2200** *DL5GG/YV5, ZS1OH*.

14MHz. 0100 4S7EA. **0500** FK8DD, *HH2CL*, TJ1GH, *ZK1CQ*. **0600** KH6IJ, KL7. **0700** VK9ZH, ZK1CG/N. Cook. **0800** FO8HL, VK (until 1000). W6, W7, ZL (until 1000), *ZM7VU*. **0900** *FG7AM*, ZL4OY/A. **1000** C31YG. **1500** *J20/Z*. **1600** AM0IBKC (World Cup st'n), *FR7BX, VK9YB, VQ9WB*. **1700** *JT1KAA*, S79WHN, UA1PAM. **1800** *VK9NM/LH, ZM7VU*. **1900** FP0FSZ, DA2AR/HB0. **2000** AL7BL, *HS7AID*. ZD8IC, *3X1Z*. **2100** KP2A/KP1, *V2AU*, VK8NE. **2200** *AH2M*. **2300** *BV2A*, VE1AI/1 (Sable Is), *VU2BK*, W6-W7, *DJ6SI/3X*.

21MHz. 0600 AP2IZ, CE3NR, DU1AU, KH6. **0700** KH2AL. **0800** FG7BT, HC8SL, HS1ALP, JA, KL7 (until 1100), ZK1CQ. **0900** ZL (until 1100), 9M8PW. **1000** *BY1PK*, J20/Z, JT1BG, VK9NM/LH, VK9NS, 4X4VE/5N8, 5W1DQ. **1100** *UA0YT*. **1300** WA6LOS/DU2, VC8YH, W (until 2100), *3X1Z*. **1400** JA (until 1900), *M1C*. **1500** EL2A/OD5, ZK1MD. **1600** EA9GD, *J20/Z, XZ9A*. **1700** AP2SQ, *BY1PK, FR0GGL, JD1BET*, ZB2BX, 9V1TL. **1800** FG7XL, FR7ZN, HL1AFB, *KH6IJ*, S79WHW, ZL, 4K1A, 5R8AL, 9X5MH. **1900** D44BC, VK9XM. **2000** P42J. **2200** VP2MGQ, W6.

28MHz. 0600 7P8BK. **0800** J20/Z, JA (until 1000), VK (to 1300), *ZC4YC*. **0900** HL1SF, HS1AMC, HZ1HZ, Z21CK, ZL (to 1100), 9N1BMK. **1000** *C53AP*, P29NPL, DL2VK/ST3, VU, 5N3TW, 8Q7DL. **1100** FB8WG, JY9RV, W (East coast until 2100), YJ8NSO, 9Y4IH. **1200** AP2HM, CR9AN, D44BC, P29s CH, GO, VK8, VK9NYG, *VS6IW*. **1300** FB8WG, TL8CK, VK9NND, 9K2FN. **1400** A4XJR, FR7CE, OD5AW, VS6, YB0ACL, *3X1Z*, 5T5AY, 6W8AH. **1500** *KP2A/KP1*, DL2VK/ST3, K6GXO/V2A, *VK9XM*, VP5WJR, W (West coast until 2000). **1600** D44BC, EP2TY, FH8OM, HZ1AB, JZ0/z, V9ADX, 4K1HK, 6D5DDD, 9V1VY. **1700** H5AHF, S79MC, TN8AJ, K6GXO/V2A, *VE1AI/1*, 5H3BH, 7Q7LW. **1800** VP8ZV, VQ9JB, *4S7MX*. **1900** *J28DM*, W5RRR (Johnson Space Centre), 3B8CF. **2200** W6.

Thanks to all correspondents and to the following for items extracted: the *Ex-G Radio Club Bulletin* **(W3HQO)**, *Long Skip* **(VE3EUP)**, *DX'press* **(PA0GAM)**, *CQ Magazine* **(W1WY)**, *DXNL* **(DL3RK)**, the *DX Bulletin* **(K1IN)**, the *Long Island DX Bulletin* **(W4UL/W2IYX)**, and *DX News Sheet* **(Geoff Watts)**.

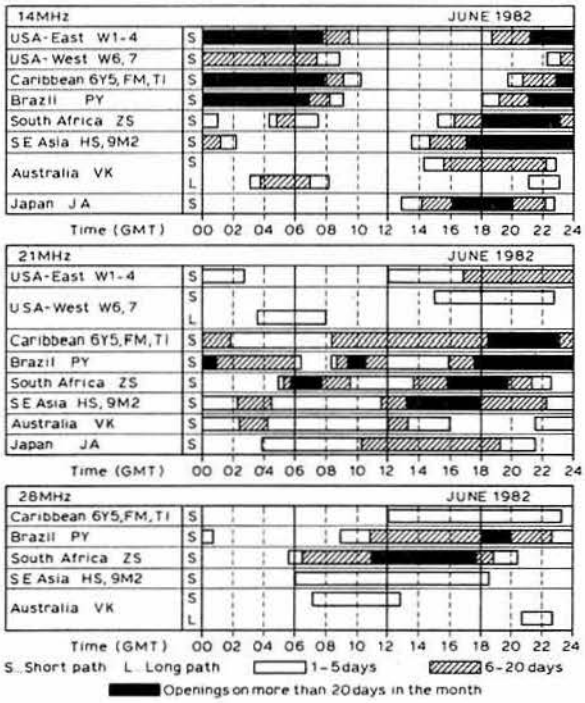
All news for **September** issue by **22 July** please and for **October** by **2 September**.

Propagation predictions

The months of June, July and August are the least favourable for dx, as the F2 frequencies are considerably lower than during the winter months. The **28MHz** band will be practically unusable in most directions; traffic with the USA will occur only infrequently, and with South America only for a few hours, but traffic with South Africa will be more certain.

On **21MHz**, eastern North America will not be heard every day with any certainty, but traffic with Central and South America—as well as Africa and Asia—will be certain. Some compensation for the poor dx conditions during the summer months are the short-skip conditions caused by sporadic-E, which will make European traffic possible on **21** and **28MHz**.

During the summer **14MHz** will be specifically a night-time band. Traffic with Australia and SE Asia will be possible during the afternoon, but will be interrupted by European QRM (often via short-skip). DX will be possible on **7MHz** when the greater part of the path lies in darkness, but again European QRM and static will interrupt traffic. During the day **7MHz** will be an ideal band, without the dead zone, for local traffic, while **3·5MHz** will be better for local traffic at night. Dead zones will not interrupt **3·5MHz**, not even just before sunrise.



HF propagation study

Band predictions for June 1982

		28MHz	21MHz	14MHz	10MHz	7MHz	3·5MHz
	GMT	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122
		024680246802	024680246802	024680246802	024680246802	024680246802	024680246802
EUROPE							
Moscow		.....	...111...122.	545555555787	865433334578	642111111357	3.....24
Malta		.....	...121111321	746766666888	987544445689	885211112368	+52.....35
Gibraltar		.....	.....11.	522564455776	977654445689	886422222468	++3.....4+
Iceland		.....	.....	2..122122343	754444444567	665422222345	332.....2
ASIA							
Osaka		.....	...1121112231	1...21.12574	351	.....2.	.....
Hong Kong		.....	111232223442	3...11.13687	364	132	.....
Bangkok		...111...11.	112233234553	51...1.13688	3.....367	1.....135	2
Singapore		...111.....	212344334442	51...1.13688	3.....367	1.....135	2
New Delhi		...111...111.	223333335664	74.....13689	51.....368	3.....135	2
Teheran		.1222112221	335433345775	873....13689	841....368	62.....135	3.....2
Colombo		..122211211.	323434345665	84...1.13689	62.....368	4.....135	2
Bahrain		.1222222331	435443446787	974....13689	851....368	62.....146	3.....3
Cyprus		...1111.111.	314555545775	987544456799	975211123578	752.....257	42.....24
Aden		1.1223333432	646534456888	9851....2689	862.....368	64.....146	4.....3
OCEANIA							
Suva (S)		.....	.....11.	..3421.12551	..22.....22	.....	.....
Suva (L)		21.1.....32	4456.....75	.1552....262	..23.....23.	.....	.....
Wellington (S)		.....	...11.....21	225421....74	..32.....252	..1.....2.	.....
Wellington (L)		21.1.....2	6556.....57	45762....175	1243.....252	..1.....2.	.....
Sydney (S)		.....	1134321....2	212521.12326	....2.....353	131	.....
Sydney (L)		1.....1	53341....16	32463....66	..13.....153	31	.....
Perth		..1221.....	32455431....	631121.1112.	41.....351	1.....134	2
Honolulu		.....	1111	.14321..22..	..32.....	.....	.....
AFRICA							
Seychelles		..1222333111	536544456666	9851....2689	862.....368	63.....146	4.....3
Mauritius		..1223333322	4.6545556777	9561.1..2689	873.....368	65.....146	32.....3
Nairobi		1.1222444532	746644556888	9972....2689	884.....368	652.....146	32.....3
Salisbury		2..222455522	744744557888	99751....2689	8852.....368	762.....146	43.....3
Capetown		...22245542.	765556873	73.521....2689	8712.....368	662.....36	43.....3
Lagos		1..122455642	753654456888	99752....2689	8852.....368	663.....36	43.....3
Ascension Is		....2234454.	441164446885	997521....2589	8863.....368	763.....36	43.....3
Dakar		21.13134542	76566445887	99863....589	8863.....268	763.....35	43.....2
Las Palmas		....1...1.11.	421354455665	998765555799	997532222478	87521.....157	542.....24
S AMERICA							
South Shetland		.....24442.	.....145687.	1.....1..1586	623.....268	763.....35	43.....2
Falkland Is		243431	3....2456886	944111..1589	8762.....258	763.....35	43.....2
Rio de Janeiro		1.....1243442	754114455787	998521....379	8863.....57	763.....25	43.....2
Buenos Aires		2.....1233332	7544.4455787	998611..1369	8863.....47	663.....15	33.....2
Lima		1.....11122	642342343356	997631....26	8863.....4	6631.....1	33.....
Bogota		1.....1..111	632233333246	997631....16	7863.....3	5631.....1	23.....
N AMERICA							
Barbados		1.....1.11121	642344333367	997631....37	8863.....4	6631.....2	33.....
Jamaica		11	521112232235	887531....5	6863.....2	363.....3	.....
Bermuda		11	521113222245	887531....16	7863.....3	453.....1	.2.....
New York		.....	41...1111124	786421....15	5753.....2	253.....2	.....
Mexico		.....	31....111123	676421....1	3753.....	153.....2	.....
Montreal		.....	31...1111124	775321....15	5753.....2	253.....2	.....
Denver		.....	2.....1	46531.....1	2553.....	.22.....	.....
Los Angeles		.....	1.....11	25531..11...	.353.....	.12.....	.....
Vancouver		.....	1.....	24531..11...	.253.....	..2.....	.....
Fairbanks		.....	.....	123421.11211	..22.....	.....	.....

NEW PRODUCTS

Ambit TE144/28 vhf converter

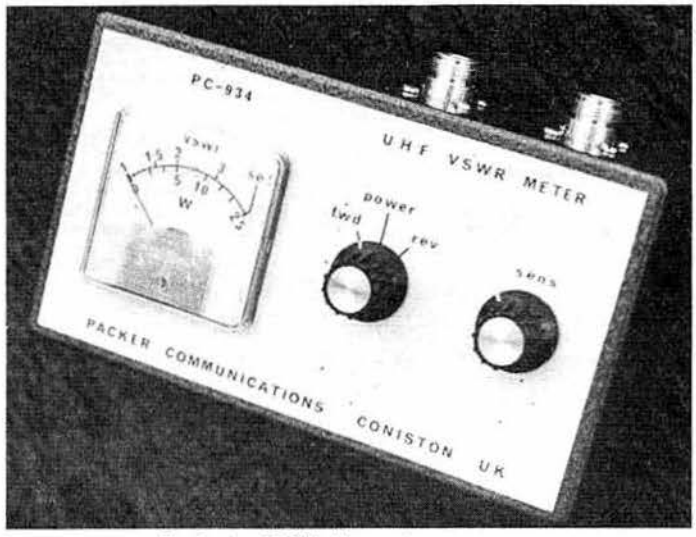
This crystal-controlled system can be supplied to convert any frequency in the range 130-200MHz down to an i.f. in the region 4-50MHz. The rf bandwidth of the system is determined by a carefully designed helical vhf filter, nominally 1·5-5MHz at −3dB, with over 70dB attenuation 30MHz from the centre rf frequency. The ultra low noise factor of the unit (less than 1·5dB) coupled with a gain of 30dB, makes the TE144/28 suitable for use in direct reception applications or as an i.f. in microwave systems, the noise factor is optimized for 50Ω input termination impedance—age can be applied from an external detector if required.

Further details from Ambit International, 200 North Service Road, Brentwood, Essex CM14 4SG.

Packer PC934 uhf vswr/power meter

This instrument is calibrated at 432 and 1,296MHz, and tests indicate that it is also of use at 2,300MHz. It has a 3:1 max vswr, 1·05:1 max vswr degradation, 0·15dB max insertion loss, 0-25V power calibration; and 100W power max (switched to vswr).

The PC934 (supplied for any single band—432 or 1,296MHz) costs £38.95 incl VAT and p&p. The PC934A covers both bands and costs £44.55 incl VAT and p&p. Further information from Packer Communications, Old Station, Coniston, Cumbria LA21 8HQ.



The Packer PC934 vhf vswr/power meter

COUNCIL PROCEEDINGS

A brief report of the Council meeting held on 27 February 1982.

Present: Dr E. J. Allaway (President, in the chair), Mr R. Bellerby, Dr D. S. Evans, Messrs K. A. M. Fisher, F. D. Hall, L. N. G. Hawkyard, G. R. Jessop, T. I. Lundegard, W. J. McClintock, B. O'Brien, H. S. Pinchin (members of Council), D. A. Evans (general manager/secretary), A. W. Hutchinson (editor), and Mrs H. M. Allin (minutes secretary).

Apologies for absence were received from Messrs Barrett, Bazley, Cornish, Knight, Kyle and Pratt, and Mrs Heathershaw.

Amateur radio in Poland
The President reported that he had received a letter from the President of PZK, outlining the current situation of amateur radio in Poland. Although amateur radio had been suspended, PZK did not expect problems on the IARU scene as this suspension did not apply to the day-to-day running of the national society. However, delays in correspondence were inevitable and it was requested that the address of PZK be used on all mail concerning amateur radio in Poland.

Financial report
In the absence of the hon treasurer, the general manager read his reports on the management accounts for the six months ended 31 December 1981, and on committee and other expenses during the same period.

A discussion took place on various matters concerning the legacy fund.

General manager's report
Mr Evans reported in detail on the diary of events commencing on 15 February arising from the publication of the new schedule by the Home Office. He commented on the vast amount of team work between staff and volunteers which had gone into dealing with the problem, and the lessons learnt – that other work had had to be delayed and that more staff was needed.

The general manager said that he was interested in making video recordings of some of the old-timers reflecting on their early days in radio, and the Society had invested money in lighting and other equipment to make these recordings possible. The resulting video tapes would be available for loan to clubs from the Society's audio visual library.

Mr Evans reported that the Society's advertising representative, Mr C. C. Lindsay was retiring for health reasons after almost 10 years' service. The job had been offered to Mr M. J. Hawkins, G3ZNI, the senior membership services officer, and Mr Rider, G4FLQ, had been promoted to succeed him.

Commenting on the very slow rise in membership over the preceding two months, Mr Evans said that, of members resigning, the vast majority gave the present economic climate and unemployment as the main reason. Many said they hoped to rejoin when their financial situation improved.

The general manager also reported that a large number of planning permission problems were being dealt with at the present time.

Committee business
Education
The President agreed to reply to a letter from Mr Scarr, G2WS, on the subject of representation on the City & Guilds Committee.

Exhibition & Rally
Mr Hawkyard reported on the composition of the 1982 committee.

Finance & Staff
A discussion took place on the progress of the search for new headquarters premises, and the various factors which affected the choice of location were outlined by the general manager. Mr O'Brien said that although recognized as of high priority, the committee was anxious not to rush a decision on such a vital matter.

Mr Hawkyard voiced his concern regarding certain items of historical material, currently being housed by himself and Mr Jessop. Mr O'Brien proposed that a small working group be set up to discuss antique items of amateur radio and the history of the Society.

HF
The letter from FCC dated 7 December 1981 was noted.

HF Contests
Mr Hawkyard commented on the proposed article on contest log and check log procedures.

IARU
It was agreed that Dr Allaway attend the Region 3 conference, to be held in Manilla on 2-5 April 1982, on behalf of the Society. It was noted that Mr Bellerby would be in the area at the time of the conference, and Council expressed a wish for his attendance at the conference as a guest.

Dr Allaway read a letter from the Solomon Islands Radio Society, requesting RSGB to be the proxy for SIRS at the Region 3 conference. This was agreed by Council.

Interference
A letter from the chairman, suggesting that Mrs Heathershaw be invited to join the committee, was read by Dr Allaway, who agreed to contact Mrs Heathershaw and then reply to the committee.

Membership & Representation
It was unanimously agreed to invite Messrs K. A. Crouch, G8KEN (RR8), and W. R. Parkinson, G3FNM (RR1), to serve on this committee during 1982.

An official regional meeting, to be held in Region 1 on 9/10 October 1982, was also approved unanimously.

Microwave
Dr Evans said there were still problems with AMSAT regarding band plans.

Propagation Studies
The minutes of a meeting of the committee were received without comment.

Raynet
A recommendation was noted, and the chairman would be asked to formulate proposed terms of reference for Council's consideration. A recommendation to invite Mr Batts, G8LWY, to serve as a corresponding member, was accepted.

There was general agreement that the report on Raynet from Mrs Heathershaw was most encouraging.

Technical & Publications
Dr Evans outlined the current publication situation, and spoke of a proposed publication on the history of amateur radio.

All Council members would receive copies of all new publications in future.

VHF
Mr McClintock's membership of this committee was agreed.

VHF Contests
Mr Hawkyard reported that during NFD the 70MHz band would use ssb until 6am, thereafter cw only until 6pm. Repeat contacts would be permitted. Council voiced support for this idea as an experiment.

Membership and representation
Council noted reduced subscriptions in respect of 16 members. Life membership was granted to Mr G. J. Petrie, G3PDG. Waived subscriptions in respect of three members were approved.

Affiliation was granted to: British Amateur Radio Teleprinter Group; Gold Coast ARS, Queensland, Australia; Halifax & District ARS; Hartlepool ARS; HTV Radio Club, Bristol; Kelso ARS, Roxburghshire; Mendip Repeater Group, Bath; Midland Radio Club, Birmingham; Mid-Ulster ARC; Pinfold Radio Club, Walsall; Radio Club of Thanet, Kent; Tynedale Amateur Radio Club.

The appointment of the following area representatives was noted: A. M. Cooper, G3TKD, Chester and district; R. J. B. Morgan, GD3KGC, Isle of Man.

Committees
A discussion took place on the position of corresponding members of committees, and it was agreed to advise committee chairmen of Council's directives regarding them. A further discussion took place on committee budgets.

Appointment of hf manager
After discussion it was agreed to leave this position vacant during 1982.

Appointment of microwave manager
It was unanimously agreed that Dr Evans be re-appointed for 1982.

Appointment of Intruder Watch organizer
Mr Cook, G5XB, was retiring from this position in April, and the President had written to him asking if he had a suggestion for his replacement. It was agreed that this was a highly specialized position and careful consideration should be given to the future organizer.

Other items of business
Council approved the acceptance by the President of an invitation from UBA to attend that society's agm in Ostend on 15 May.

A letter of congratulation has been sent to Mr Geoff Watts on the production of the 1,000th issue of *DX News Sheet*.

It was agreed that Mr Baptiste be invited to attend the next meeting of Council.

OBITUARIES

The Society records with regret the deaths of the following radio amateurs:

Mr A. Brennend, G4AVA
Alec Brennend died on 8 September 1981, aged 54 years. He was well known on the hf bands for his excellent operating and friendly manner. He was very adept at construction and used a largely home-constructed station. He was a leading member of the WAB Award Committee, and a driving force behind the successful Northern Contest Club NFD team. At the time of his death he was very active on 14 and 3·5MHz, and the QSL manager for a 3D6 station. He was always willing to help others and was busy coaching several people in morse code.

Mr L. J. F. Budd, G8PTB
Leslie Budd died on 21 March, aged 61. Although he did not obtain his licence until 1978 he had always been interested in amateur radio.

Mr W. L. Ely, G3HQQ
Lew Ely died on 18 November 1981, aged 64. He had been a member of the RSGB since the 'thirties. He obtained his licence in the early 'fifties and became a very accomplished cw operator, particularly heard on top band, and more recently, 3·5MHz. As an swl he won the BERU contest on two occasions and was a past member of FOC.

Mr F. K. R. Hayer, G3DPB
Mr Hayer died on 22 November 1981. He was well known overseas as he continued his hobby while in India in the Royal Corps of Signals.

Mr J. H. MacDonald, G4GJ
John MacDonald, who died on 16 July 1981, was well known both in West Yorkshire and overseas. He was keen to help newcomers to the hobby, and operated mostly on top band.

Mr D. Ormston, G4BYK
Don Ormston, who died on 28 December 1981, was an active member of Hornsea ARC, and a member of the local Raynet group. He was a keen hf operator, and worked for and received many awards on the band.

Mr D. Smith, G3TNJ
Dan Smith died on 27 March. He had been a long-time member of both the RSGB and Crawley ARC, and continued to operate until shortly before his death, despite physical handicap and limited sight.

Also:
Mr J. P. Barnes, G3BKT, in January;

Mr R. Bennett, G4LEW, on 6 February;

Mr A. C. Copsey, G8GPG;

Mr A. W. Crump, RS47155, on 8 March;

Mr M. B. Edwards, G3MV, on 11 November 1981;

Mr C. J. Guscott, G3HXR, on 3 September 1981;

Mr R. C. Philpot, RS2359; and

Mr A. Stanley, G3WUR, on 18 November 1981.

CONTEST NEWS

First 1·8MHz Contest 1982 results

Entries in both sections were higher than in 1980 and 1981, a welcome trend. However, activity from the UK was no greater than in previous years judging by overall scores, with minimal support from GW and none from GI.

Conditions were mainly good throughout the contest, except for a spell between 2200 and 2300h, when signals were subject to fading and noticeable flutter.

Walt Davidson, GW3NYY, keyed 154 contacts and 62 multipliers to win by a comfortable margin from Keith Spicer, G3RPB, who made 148 contacts and 55 multipliers, operating from G6KQ. Peter Linsley, G3PDL, was third with 148 contacts, but only 43 multipliers.

Michael Kinnersley-Taylor, GM3WTA, a regular supporter of 1·8MHz contests, took the Maitland Trophy with an aggregate of 843 points, while M. S. Chamberlain, G3WPH, the highest placed "First Time" entrant, and A. R. Gilding, G3KSH, the only "Senior Citizen" entrant, both win certificates.

In the Overseas section, Petr Mazanec, OK1DFF, took first place with 75 contacts and 34 multipliers, from Peter Woermer, OZ1W, who made 72 contacts and 30 valid multipliers. H. T. Schmitz-Goertz, DK6PB, was third, making 63 contacts and 29 multipliers.

Comments from the logs:

"Many counties not heard—where were all the GW stations?"-*G3BDQ;* "Was the weak signal that gave me 004 VE1AVS?"-*G4BUO;* "As usual a very good contest"-*G3ZGC;* "World beating aerial blew down in gale the night before the contest"-*G4EXD;* "Very worthwhile as each new county or country was a 'first' for top band"-*G4FKS;* "Some of my reports rather poor, but surprises in the form of EA6CE"-*G3YMC;* "Used G6KQ to eliminate problems from confusion with G3RBP—it worked!"-*G3RPB.*

There were no comments on the rules so presumably all are satisfied with them! The HF Contests Committee would be interested in any ideas on ways to stimulate activity, especially from GW and GI, but also from all UK call areas.

G3KKQ

UK SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	GW3NYY*	763	23	G3YMC	440
2	G6KQ (G3RPB)*	712	24	G4BOU	432
3	G3PDL*	684	25	G4BLX	410
4	G4BUO/A	657	26	G4DUS	405
5	G3RBP	645	27	G3RSD	400
6	G3OAY	641	28	G3KDY†	385
7	G3IGW	623	29	G8VF	380
8	G4HMS (G3HZL)	612	30	GM3PPE	369
9	G3OZF	595	31	G3ZJK	359
10	GM3WTA*	587	32	G4KKZ	351
11	G3XTT	586	33	G4EXD/A†	345
12	G6UT	578	34	GM3ZRT	325
13	G3XEP	561	35	G3AVL/P†	321
14	G3BDQ	537	36	G3BGM	314
15	G3ZGC/A	524	37	G3ZRZ	263
16	G4GIR	522	38	G3KSH*††	235
17	G4KGG	479		G4HSD	235
18	G3JKS	476	40	G3MCX	221
19	G4AAQ	475	41	G3FVW	185
20	G3WPH*†	467	42	G4FKS	173
21	G2MJ	446	43	G3AWR	131
22	G3CCZ	441			

OVERSEAS SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	OK1DFF*	392	14	UB5ZAT†	167
2	OZ1W*	356	15	UQ2GFU	147
3	DK6PB*	334	16	OL4BET†	100
4	OK1DVK	286	17	OH2SX*	98
5	OK3KFO	282	18	UB5VK	97
6	UQ2GDM*	237	19	UQ2GII	75
7	UP2BCG*†	200	20	HB9AAD	66
8	UT5AB*	197	21	UH8DC*	41
9	OL2BCC	194	22	UD6DKW*	40
10	OL1BBR†	192	23	UQ2GHT†	38
11	OK2BWM	182	24	RA9AKM*	22
12	HB9AQS*	177	25	LZ2CW*	7
13	OZ7JQ	168			

*Award winners
†First-time award entrants
††Senior citizens award entrants

Check logs received with thanks from G3BPM, G3KDB, G3XTJ, G4EBK and OK1KMP.

Cumulative Activity Periods 1982 results

Nearly 100 different callsigns appeared in the 51 logs submitted for the eight different activity sessions on 1·8 and 3·5MHz that were held during January. Many of those who participated were on for more than one session, and a few operated on both bands in every period. The checked scores are shown in the tables together with the participants' club affiliation.

Almost every log contained comments in favour of the present contest format and arrangements. Space precludes listing all the comments but the following are typical:

"Once again enjoyed taking part in this most useful exercise. Seems that many new callsigns were evident"-*G4HKC;* "While an excellent event, it could be made more useful to the newcomer by adding required contest exchanges such as name, input power, QTH, county code, serial number etc. Thanks for an enjoyable event"-*G4ARI;* "For a contest to encourage novices, most stations sent too quickly"-*G3MCK;* "Experienced operators took the time to help and advise the clowns like me, and many stations came up time and time again. A really enjoyable contest and am looking forward to the next one"-*G3MCX;* "As usual it was a very relaxed affair. I was delighted when one station, and an English one at that, greeted me in Welsh. I look forward to next year"-*GW3SB;* "A very enjoyable contest and I look forward to meeting all stations again next year"-*G4HKA;* "Contest good for testing antennas, but why Saturday morning? Had me dashing around like a mad man at 1201 to catch the shops. Found it ideal for my attempt at the 40m cw contest in Feb"-*G4BLX;* "Excellent idea these contests, keep them going"-*G3LQI;* "A very pleasant and relaxed contest with time for an exchange with old friends. Thanks again"-*G4KGG;* "Duration of these short sessions suits me, pity that there were not more novices about. Thanks"-*G2HLU;* "My object was to get my first contest exposure, and it worked! My first period was near panic-by the last session it was cool efficiency! Who knows, my club may let me take the key next NFD. Thanks again"-*G4GXI;* "I tried, but what a mess as you will see from the logs. Please treat them as checks only. I wonder how I ever passed the morse test. Must congratulate every station that I worked for their QRS and repeats. Next year I promise to be better. Thanks for showing me the error of my ways"-*G4---(Anon by request).*

The HF Contests Committee thanks everyone who took part, and in particular those who sent in logs and comments. Several very useful suggestions were made for next year's event and these will be considered by the committee.

G6LX

Results by callsign (A-Z) for 1·8MHz sessions

Callsign	Club	4 Jan	12 Jan	20 Jan	28 Jan	Total
G3CCZ*	Colchester	–	9	–	–	9
G3GC*	–	–	–	19	–	19
G3KDB	(HFCC)	–	–	–	check	–
G3LQI*	Worthing	–	–	10	1	11
G3MCX*	SRCC	18	check	18	check	36
G3NKS*	–	–	15	–	33	48
G3SJE*	Edgware	–	31	31	–	62
G3WRQ	Hereford	–	27	–	22	49
G3XTJ	(HFCC)	–	–	check	check	–
G3XWZ*	–	35	39	–	–	74
G4BLX*	East Barnet	30	–	36	–	66
G4CNY	Hereford	–	40	check	44	84
G4EBK	Grimsby	–	check	12	12	24
G4EYD*	–	17	17	–	–	34
G4GLC*	–	24	–	–	–	24
G4GXI*	–	19	22	–	–	41
G4HKC*	Colchester	14	check	check	15	29
G4HZF	–	check	–	–	–	–
G4KAL	Grimsby	–	11	12	–	23
G4KGG*	Loughborough Falcon	34	36	–	–	70
G6LX*	(HFCC) SRCC	check	check	check	check	–
GM4KGJ*	Aberdeen	check	26	check	26	52

Total is sum of scores in best two sessions
Stations marked * also participated in the 3·5MHz sessions.

Results by callsign (A-Z) for 3·5MHz sessions

Callsign	Club	3 Jan	9 Jan	17 Jan	23 Jan	Total
G2HLU	–	–	–	37	32	69
G3AWR	–	check	check	18	11	29
G3CCZ*	Colchester	28	–	–	21	49
G3DZW	Colchester	–	–	16	15	31
G3GC*	–	–	–	43	29	72
G3HQH	–	36	–	38	–	74
G3LQI*	Worthing	–	–	34	–	34
G3MCK	–	33	–	40	check	73
G3MCX*	SRCC	20	check	check	19	39
G3NKS*	–	31	33	–	–	64
G3PSP	–	–	check	–	–	–
G3SJE*	Edgware	30	–	42	–	72
G3XTJ*	(HFCC)	–	–	check	check	–
G3XWZ*	–	37	–	–	–	37
G4ARI	Leicester Poly	–	–	43	34	77
G4BLX*	East Barnet	–	–	43	31	74
G4ECI	–	36	check	31	–	67
G4EYD*	–	21	22	–	–	43
G4FAD	Hereford	36	–	–	36	72
G4GLC*	–	–	–	40	31	71
G4GXI*	–	–	–	21	17	38
G4HKA	Verulam	24	29	–	–	53
G4HKC*	Colchester	check	check	11	23	34
G4KGG*	Loughborough Falcon	33	check	check	29	62
G4KRG	Stockport	–	–	34	27	61
G4KTN	Worcester	13	–	16	–	29
G4MLU	Edgware	check	check	25	24	49
G6LX*	(HFCC) SRCC	check	check	check	check	–
GM4KGJ*	Aberdeen	check	–	check	check	–
GW3SB	–	check	29	32	check	61
GW4KUJ	–	check	–	check	check	–

Total is sum of scores in best two sessions
Stations marked * also participated in the 1·8MHz sessions.

Affiliated Societies Team Contest 1982 results

The success of AFS continues. This year saw a small rise in the number of groups taking part, and record club and individual scores once again. This was despite average band conditions and atrocious weather conditions: many groups were unable to muster their full complement of operators or to erect special antennas because of heavy snow, and no-one dared venture out portable.

The traditional battle between Stockport and East Barnet continued, with East Barnet emerging the winners by 100 points despite losing G3YDX, their top scorer in recent years. Leicester Polytechnic drew on a range of operators to gain third place, some way ahead of the rest of the field. Verulam and Norfolk returned to the top ten.

A major cause of lost points was incorrectly copied callsigns—the usual crop of G8 plus 3 and G4Y calls appeared in the logs. Larger points losses were due to unmarked duplicates. A services operator, who should know better, had his score reduced by 628 points mainly because of five unmarked duplicates. On the other hand some are all too keen to spot dupes—the adjudicator's own call was frequently confused with G4BOU, and G3ZDD/G3ZZD, G3KKQ/G4KKQ, G4RS/G5RS etc suffered as well. With up to 350 stations active it is impossible to keep an accurate mental record of stations worked.

Subject to the approval of Council, East Barnet will receive the Edgware Trophy, and

certificates of merit go to G3SSO (highest individual score) and to East Barnet, Stockport, Leicester Poly, GCHQ and Glenrothes (leading affiliated societies in each RSGB zone.

Comments

"Super contest, much enjoyed"—Leeds; "Enjoyable though blasted cold"—*G3HZL;* "Antenna rigged in a snowstorm"—*G3JJG;* "Had another op but rig blew 5min before start—need later start time"—*Glenrothes;* "WX decimated entry"—*Cheltenham;* "Rules perfect. Four hours of wall-to-wall QRM"—*G3VAA;* "G3S—would not QRS—no QSO"—*Worcester op;* "Had to QRT for a while—a car ran into the front wall"—*Stockport op;* "Much poor netting"—*G3RMF;* "Return contest to 1·8MHz. Why bother to send AFS?"—*Sutton & Cheam;* "Will do better next year (can we do worse!)"—*Halifax.*

G4BUO

INDIVIDUAL SCORES

Posn	Callsign	Score	Society
1	G3SSO	1,869	GCHQ (A)
2	G3TR	1,849	Crawley
3	G3RTE	1,831	East Barnet
4	G3OAY	1,772	Leicester Poly (A)
5	G3RPB	1,759	East Barnet
6	G3WPF	1,719	Stockport (A)
7	G3HVX	1,715	Hereford (A)
8	G3NOM	1,702	Stockport (A)
9	G4DJX/A	1,675	Verulam (A)
10	G3PEK	1,652	Stockport (A)
11	G3XTJ	1,621	East Barnet
12	G3UKS	1,615	Maidenhead (A)
13	G3SJJ	1,602	Leicester Poly (A)
14	G3JKS	1,585	Verulam (A)
15	G3LDI	1,560	Norfolk (A)
16	G4MCC	1,547	Stockport (A)
17	G3RFS	1,536	East Barnet
18	G3FKH	1,525	Hereford (A)
19	G3SJX	1,520	Addiscombe
	G4BUO	1,520	Gravesend (A)
21	G3SDC	1,515	Leicester Poly (A)
22	G4BUX	1,503	Stockport (A)
23	G3PDL	1,500	Scunthorpe
	G3RIR	1,500	Leicester Poly (A)
25	G3ROZ	1,495	Addiscombe
26	G3TLX	1,476	East Barnet
27	G4CNY	1,465	Hereford (A)
28	G3IAS	1,440	Surrey RCC
29	G3UFY	1,435	Addiscombe
30	G3RWL	1,420	Southgate
31	G4FPH	1,410	Leicester Poly (A)
32	G3YVR	1,405	Crawley
33	G5RS	1,400	Guildford (A)
	G3TQD	1,400	Worcester (A)
	G3ORY	1,400	Leicester Poly (B)
36	G3ASR	1,382	Edgware (A)
37	G3PDH	1,365	Norfolk (A)
	G3OHP	1,365	Gravesend (A)
	G4FAM	1,365	Gravesend (A)
40	G4KPE	1,362	Maidenhead (A)
41	G3JEQ	1,335	Thames Valley
42	G3SXW	1,330	Thames Valley
	G8DV	1,330	GCHQ (A)
	G5EBU	1,330	GCHQ (A)
45	G3WYK	1,320	Maidenhead (A)
46	G3VZT	1,319	Norfolk (A)
47	G4DUS	1,310	Verulam (A)
48	G5CMX	1,285	Maidenhead (A)
49	G4CDY	1,280	Addiscombe
	G4DBW	1,280	Clifton
51	G3POI	1,270	East Barnet
52	G3BFP	1,265	Surrey RCC
53	G3SYM	1,260	Guildford (A)
54	G3JKF	1,259	Crawley
55	G4GVC	1,240	Leicester
	G3GRO	1,240	Crawley
	G3XVF	1,240	Norfolk (A)
58	G5OD	1,225	Guildford (A)
59	G4FAD	1,220	Hereford (A)
60	G6LX	1,207	Surrey RCC
61	G3JJG	1,200	Cheltenham
62	G3JFF	1,195	RNARS HMS *Mercury*
63	G3XRX	1,176	Cray Valley
64	G4IJJ	1,150	Verulam (A)
	G3IGW	1,150	Halifax
66	GM3ZSP	1,140	Glenrothes
67	G4ITP	1,135	Leicester
68	G3SJV	1,115	Southdown
69	G3FXA	1,105	GCHQ (A)
	G4ARI	1,105	Leicester Poly (B)
	G3RSD	1,105	Grimsby
72	G3VAA	1,095	Farnborough
73	G3PSP	1,094	Edgware (A)
74	G3LOI	1,090	Worthing
75	G3DCZ	1,085	Sutton & Cheam
76	G2HDU	1,080	GCHQ (A)
77	G3LPN	1,077	RNARS HMS *Mercury*
78	G3VYI	1,072	Addiscombe
79	G3LCH	1,065	Sutton & Cheam
80	G3SHY	1,062	Edgware (A)
81	G3COJ	1,060	Ariel
	G3RUG	1,060	Stockport (B)
83	G3IBB	1,050	Catterick Garrison
84	G3HZL	1,045	RNARS HMS *Belfast*
	GM4IPS	1,045	Glenrothes
86	G3WKS	1,040	West Kent
87	G6RC	1,030	Crawley
88	G4DBL	1,025	Crawley Court
89	G4FJW	1,015	Gravesend (A)
	G3EUE	1,015	Surrey RCC
91	G4FFD	1,014	Hereford (A)
92	G4IUF	1,010	White Rose (A)
93	G4EWJ	995	Wirral
	G3XWZ	995	Mansfield
95	G3KAF	990	Stockport (B)
	G4FIM	990	Leeds
97	G4CWY	985	Leicester
98	G2MI	980	Cray Valley
	G3GC	980	Edgware (A)
100	G4BOF	965	Hereford (B)
101	G3RDQ	950	Crawley Court
102	G3LIK	945	RNARS HMS *Belfast*
	G4ISK	945	Farnborough
104	G3JTG	930	GCHQ (B)
105	G3UJV	920	Verulam (A)
106	G3CCZ	917	Colchester
107	G4BOU	915	Verulam (B)
108	G3AAQ	907	Leicester Poly (B)
109	G3ULN	905	Plymouth
	G3IFB	905	GCHQ (B)
	G3EJF	905	Catterick Garrison
112	G2FNK	895	Ariel
113	G4ATU	890	Malvern Hills
114	G3TWG	885	Maidenhead (A)
115	G4FIE	882	Leicester Poly (B)
	G3AIV	882	Thames Valley
	G3SVL	882	Southdown
118	G4ECI	880	Stockport (B)
119	G4FRN	865	RNARS HMS *Belfast*
	GM4GRC/A	865	Glenrothes
121	G3SNX	860	Stockport (B)
122	G4EBK	855	Grimsby
123	G4FAS	845	Stockport (B)
	G4IDC	845	Leeds
125	G4EYD	844	S Birmingham
126	G3ZSF	840	Grimsby
	G2FOS	840	Wirral
128	G3JNB	837	Thames Valley
129	G3HTI/A	825	Grimsby
130	G4CWH/A	815	Sutton & Cheam
131	G2KV	810	RNARS Yeovil
132	G3VKM	809	Norfolk (A)
133	G3WRQ	805	Hereford (B)
134	G3BPM	795	Thames Valley
	G4HTD	795	Plymouth
136	G3RSM	790	Bury (A)
137	G4KRG	785	Stockport (C)
	G3PSM	785	White Rose (A)
139	G4CHL	780	Gravesend (A)
140	G4CJU	778	Catterick Garrison
141	G3OVT	770	Stevenage
	G4KKZ	770	RNARS Culdrose
	G3DOT	770	Shefford
144	G4BNT	745	Grimsby
	G4IUX	745	Bromsgrove
146	G3TIE	740	Southgate
	G3BTO	740	RNARS HMS *Mercury*
	GM3UM	740	RNARS Rosyth
149	G3RLF	735	Worcester (A)
150	GM4KGJ	724	Aberdeen
151	G4LYA/A	720	Leeds
	G3NXQ	720	Worcester (A)
153	G4GGV	715	Maidenhead (B)
154	G3VCT	710	Maidenhead (B)
155	G4FOT	705	Bury (A)
	G3SNN	705	GCHQ (B)
157	G3TAN	695	Catterick Garrison
158	G3CWL	685	Sutton & Cheam
	GM3KPD	685	RNARS Rosyth
160	GM4EJI	680	Glenrothes
161	G4IZB	677	Farnborough
	G4NFX	677	Scunthorpe
163	G4KLD	675	Norfolk (B)
	G4IXF	675	Stockport (C)
165	G8SC	670	Southdown
	GM3DZB	670	Aberdeen
167	G4HMD	645	Edgware (A)
168	GM3UA	640	RNARS Rosyth
	G4FUH	640	Scunthorpe
170	G4BOH	635	Bury (A)
	G4GRU	635	Stockport (C)
172	G4KDL	632	Pye
173	G4FMI	630	RNARS Warrington
174	G3YAJ	625	Colchester
175	G3PZP	622	RNARS HMS *Belfast*
176	G4DYC	617	Norfolk (B)
177	G4FIV	610	RNARS Culdrose
178	G3FMW	610	Catterick Garrison
	G3LQP	610	Sutton & Cheam
180	G4IMP	607	Dover
181	G3LMH	605	Crawley Court
182	G3KOJ	602	RNARS HMS *Mercury*
183	G3KTZ	600	Southgate
184	G3AQM	590	RNARS HMS *Belfast*
	G3ZDD	590	Guildford (A)
186	G3JZV	585	RNARS HMS *Mercury*
	G3SGQ	585	RNARS Leeds
188	G3SXE	580	Cray Valley
	G4BJQ	580	Farnborough
190	G3RMF	575	Worcester (A)
191	G4FKS	560	White Rose (A)
	G4JFN	560	Farnborough
193	G4HZF	556	Grimsby
194	G3ABU	554	RNARS Plymouth
195	G4BCY	545	Guildford (A)
	G4BJU	545	Stockport (C)
	G4KZD	545	Southgate
198	G3GRS/A	537	Gravesend (B)
199	G4DDX	535	Stevenage
	G3RFJ	535	Ariel
	G3YYF	535	Southdown
	GM3VEY	535	Aberdeen
203	G4BMK	534	Southdown
204	G3HIS	530	RNARS Yeovil
	G3LVW	530	Maidenhead (B)
206	G3GMM	525	Stockport (C)
207	G3TZM	520	RNARS Barrow
208	G4EGQ	519	Dover
209	G3ASM	512	Catterick Garrison
210	G4GSY	505	Bury (A)
211	G3WL	504	Plymouth
212	G2UG	492	Halifax
213	G4GSC	490	Echelford
	G3AIO	490	West Kent
215	G4HKC	487	Colchester
216	G4RS	485	Catterick Garrison
217	G4KGM	480	Cray Valley
218	G3ORC	479	Gravesend (B)
219	G6GS	475	Guildford (B)
	G4DVK	475	RNARS Yeovil
	G4KPY	475	Wirral
222	G3WP	467	RNARS Chatham
223	G4HKA	459	Verulam (B)
224	G3UJX	455	Wirral
225	GM4GIF	452	RNARS Faslane
226	G3LSL	445	Leicester Poly (B)
227	G4CZD	443	RNARS Chatham
228	G3KKQ	440	Ariel
	G3YEE	440	Leeds
230	G3KWT	435	White Rose (A)
231	G3VNQ	427	Bury (A)
232	G3WRY	405	Leicester Poly
233	G4GOP	397	White Rose (A)
234	G4GPX	390	Worthing
235	G8IB	382	RNARS HMS *Belfast*
236	G4BVA	380	RNARS HMS *Belfast*
237	G4GPR	375	Southgate
	G3UVS	375	RNARS Plymouth
239	G4KLQ	370	Verulam (B)
240	G3CRS	365	RNARS Collingwood
241	G3MLU	360	Edgware (B)
242	G4JDI	345	Leicester
243	G3OZY	340	RNARS HMS *Belfast*
244	G4KJD	330	RNARS Yeovil
	G4EOI	330	Sutton & Cheam
246	G3WFM	317	Verulam (B)
247	GM3UU	310	Aberdeen
248	GM4DOK	300	RNARS Rosyth
	G4MIA	300	Wirral
250	GM4JLY	295	Aberdeen
251	G4FFW	285	Stockport (D)
252	G8AV	280	RNARS Plymouth
253	G4LSG	276	RNARS Collingwood
254	G4IVJ	270	Bromsgrove
	G4BEQ	270	RNARS HMS *Mercury*
	G4IRK	270	Cheltenham
275	G4FCO	267	S Birmingham
258	G3ZGA	265	White Rose (B)
259	G4KWN	255	Bury (B)
260	G4DZI	250	White Rose (B)
	G4GZC	250	Scunthorpe
262	G4KKQ	245	Leeds
	G6BQ	245	Gravesend (B)
264	G4HSD	235	Sutton & Cheam
265	G3ZZD	230	West Kent
266	GM4BKV	219	Aberdeen
267	G3ZDW	217	Colchester
268	G4KTW	210	Worcester (A)
	G4GZA	210	Scunthorpe
	G4JRZ	210	Verulam (B)
271	G3JPX	205	RNARS Chatham
	G2BCI	205	Ariel
	G5DUM	205	RNARS HMS *Belfast*
274	G3ENL	200	Stockport (D)
	G4ISO	200	Stevenage
276	G4GWJ	190	Plymouth
277	G4BWS	185	Cray Valley
278	GM4FGD	180	RNARS Rosyth
279	G3MCX	170	Surrey RCC
	G3LFB	170	RNARS Chatham
281	G2CLN	167	Bromsgrove
282	G4GYS	162	Edgware (B)
	GM3KGK	162	RNARS Rosyth
284	G4NMR	160	Worcester (B)
285	G4HXB	157	Stockport (D)
286	G3TQF	125	Leicester
287	G3KKB	110	S Birmingham
	G3OXL	110	S Birmingham
289	G4NMA	105	Stevenage
290	G4MUJ	100	Worthing
291	G4LVK	95	Bromsgrove
292	G4MPA	70	Dover
	G4JHS	70	Halifax
294	G3HII	65	Bury (B)
295	G3TQZ	60	Worcester (B)
296	G8TB	50	Surrey RCC
	G4IDB	50	Dover
298	G3VSU	40	Dover
299	G4IXV	30	Bury (B)
300	G4LUX	10	Bromsgrove

Check Logs: G3VFB, G3WVP, G4JYH, G8GF, GM3FRI, GM4GVJ, GW3JI, GW3YDX.

SOCIETY TOTALS

Posn	Society	Total points	Stations contributing to score					No of entries
1	East Barnet	8,223	G3RTE	G3RPB	G3XTJ	G3RFS	G3TLX	6
2	Stockport (A)	8,123	G3WPF	G3NOM	G3PEK	G4MCC	G4BUX	5
3	Leicester Poly (A)	7,799	G3OAY	G3SJJ	G3SDC	G3RIR	G4FPH	5
4	Hereford (A)	6,939	G3HVX	G3FKH	G4CNY	G4FAD	G4FFD	5
5	Addiscombe	6,802	G3SJX	G3ROZ	G3UFY	G4CDY	G3VYI	5
6	Crawley	6,783	G3TR	G3YVR	G3JKF	G3GRO	G6RC	5
7	GCHQ (A)	6,684	G3SSO	G5EBU	G8DV	G3FXA	G2HDU	5
8	Verulam (A)	6,640	G4DJX/A	G3JKS	G4DUS	G4IJJ	G3UJV	5
9	Maidenhead (A)	6,467	G3UKS	G4KPE	G3WYK	G5CMX	G3TWG	5
10	Norfolk (A)	6,293	G3LDI	G3PDH	G3VZT	G3XVF	G3VKM	5
11	Gravesend (A)	6,045	G4BUO	G3OHP	G4FAM	G4FJW	G4CHL	5
12	Thames Valley	5,179	G3JEQ	G3SXW	G3AIV	G3JNB	G3BPM	5
13	Edgware (A)	5,163	G3ASR	G3PSP	G3SHY	G3GC	G4HMD	5
14	Surrey RCC	5,097	G3IAS	G3BFP	G6LX	G3EUE	G3MCX	6
15	Guildford (A)	5,020	G5RS	G3SYM	G5OD	G3ZDD	G4BCY	5
16	Leicester Poly (B)	4,739	G3ORY	G4ARI	G3AAQ	G4FIE	G3LSL	6
17	Stockport (B)	4,635	G3RUG	G3KAF	G4ECI	G3SNX	G4FAS	5
18	Grimsby	4,370	G3RSD	G4EBK	G3ZSF	G3HTI/A	G4BNT	6
19	Sutton & Cheam	4,260	G3DCZ	G3LCH	G4CWH/A	G3CWL	G3LQP	7
20	RNARS HMS *Mercury*	4,199	G3JFF	G3LPN	G3BTO	G3KOJ	G3JZV	6
21	RNARS HMS *Belfast*	4,067	G3HZL	G3LIK	G4FRN	G3PZP	G3AQM	9
22	Catterick Garrison	4,038	G3IBB	G3EJF	G4CJU	G3TAN	G3FMW	7
23	Farnborough	3,857	G3VAA	G4ISK	G4IZB	G4BJQ	G4JFN	5
24	Leicester	3,830	G4GVC	G4ITP	G4CWY	G4JDI	G3TQF	5
25	Southdown	3,736	G3SJV	G3SVL	G8SC	G3YYF	G4BMK	5
26	Glenrothes	3,730	GM3ZSP	GM4IPS	GM4GRC/A	GM4EJI	—	4
27	Southgate	3,680	G3RWL	G3TIE	G3KTZ	G4KZD	G4GPR	5
28	Worcester (A)	3,640	G3TQD	G3RLF	G3NXQ	G3RMF	G4KTW	5
29	Cray Valley	3,401	G3XRX	G2MI	G3SXE	G4KGM	G4BWS	5
30	Scunthorpe	3,277	G3PDL	G4NFX	G4FUH	G4GZC	G4GZA	5
31	Leeds	3,240	G4FIM	G4IDC	G4LYA/A	G3YEE	G4KKQ	5
32	White Rose (A)	3,187	G4IUF	G3PSM	G4FKS	G3KWT	G4GOP	5
33	Stockport (C)	3,165	G4KRG	G4IXF	G4GRU	G4BJU	G3GMM	5
34	Ariel	3,135	G3COJ	G2FNK	G3RFJ	G3KKQ	G2BCI	5
35	Wirral	3,065	G4EWJ	G2FOS	G4KPY	G3UJX	G4MIA	5
36	Bury (A)	3,062	G3RSM	G4FOT	G4GSY	G3VNQ	G4BOH	5
37	Crawley Court	2,580	G4DBL	G3RDQ	G3LMH	—	—	3
38	RNARS Rosyth	2,545	GM3UM	GM3KPD	GM3UA	GM3DQK	GM4FGD	6
39	GCHQ (B)	2,540	G3JTG	G3IFB	G3SNN	—	—	3
40	Aberdeen	2,534	GM4KGJ	GM3DZB	GM3VEY	GM3UU	GM4JLY	6
41	Plymouth	2,394	G3ULN	G4HTD	G3WL	G4GWJ	—	4
42	Verulam (B)	2,271	G4BOU	G4HKA	G4KLQ	G3WFM	G4JRZ	5
43	Colchester	2,246	G3CCZ	G3YAJ	G4HKC	G3ZDW	—	4
44	RNARS Yeovil	2,145	G2KV	G3HIS	G4DVK	G4KJD	—	4
45	Maidenhead (B)	1,955	G4GGV	G3VCT	G3LVW	—	—	3
46	Hereford (B)	1,770	G4BOF	G3WRQ	—	—	—	2
47	West Kent	1,760	G3WKS	G3AIO	G3ZZD	—	—	3
48	Halifax	1,712	G3IGW	G2UG	G4JHS	—	—	3
49	Stevenage	1,610	G3OVT	G4DDX	G4ISO	G4NMA	—	4
50	Worthing	1,580	G3LQI	G4GPX	G4MUJ	—	—	3
51	Cheltenham	1,470	G3JJG	G4IRK	—	—	—	2
52	RNARS Culdrose	1,380	G3KKZ	G4FIV	—	—	—	2
53	S Birmingham	1,331	G4EYD	G4FCO	G3KKB	G3OXL	—	4
54	Norfolk (B)	1,292	G4KLD	G4DYC	—	—	—	2
55	Bromsgrove	1,287	G4IUX	G4IVJ	G2CLN	G4LVK	G4LUX	5
56	Dover	1,286	G4IMP	G4EGQ	G4MPA	G4IDB	G3VSU	5
57	RNARS Chatham	1,285	G3WP	G4CZD	G3JPX	G3LFB	—	4
58	Clifton	1,280	G4DBW	—	—	—	—	1
59	Gravesend (B)	1,261	G3GRS/A	G3ORC	G6BQ	—	—	3
60	RNARS Plymouth	1,209	G3ABU	G3UVS	G8AV	—	—	3
61	Mansfield	995	G3XWZ	—	—	—	—	1
62	Malvern Hills	890	G4ATU	—	—	—	—	1
63	Shefford	770	G3DQT	—	—	—	—	1
64	Stockport (D)	642	G4FFW	G3ENL	G4HXB	—	—	3
65	RNARS Collingwood	641	G3CRS	G4LSG	—	—	—	2
66	Pye	632	G4KDL	—	—	—	—	1
67	RNARS Warrington	630	G4FMI	—	—	—	—	1
68	RNARS Leeds	585	G3SGQ	—	—	—	—	1
69	Edgware (B)	522	G4MLU	G4GYS	—	—	—	2
70	RNARS Barrow	520	G3TZM	—	—	—	—	1
71	White Rose (B)	515	G3ZGA	G4DZI	—	—	—	2
72	Echelford	490	G4GSC	—	—	—	—	1
73	Guildford (B)	475	G6GS	—	—	—	—	1
74	RNARS Faslane	452	GM4GIF	—	—	—	—	1
75	Bury (B)	350	G4KWN	G3HII	G4IXV	—	—	3
76	Worcester (B)	220	G4NMR	G3TOZ	—	—	—	2

432MHz Fixed Station Contest February 1982 results

For the first time in the adjudicator's experience, two logs, one scored by computer and one scored by map radials, virtually tied for first place. The claimed scores differed by less than the accuracy of either method and were resolved only by rescoring each on the same independent computer program.

Only two points in over one thousand separated the final scores thereby making the absolute placing really dependent upon the accuracy with which stations gave their QRA locators. It is interesting to note that if each log had been scored as points/km, the positions would have been unchanged; each radial averaging 49·98 and 49·40 points respectively.

The unanimous opinion of all the leading stations was that conditions were flat and below average with one or two dx stations providing the encouraging promise of an improvement which did not materialize.

The 432MHz Fixed Contest has now moved quite definitely into the big station league. Contestants determined to improve their performance must, if they have not already done so, think in terms of over 300W p.e.p. output, gasfet masthead preamps and really high-gain antenna arrays. There is, however, a growing demand for low power, or restricted, events and it will be interesting to see if the forthcoming low power 432MHz contest on 1 August proves to be as popular as the abandoned low power 144MHz event.

The VHF Contests Committee acknowledges with thanks the logs submitted by DF1JC, DL4EA and DF3EE. Unfortunately these logs did not include the exchange of the full QTH required by the rules of the event and were scored in points/km. Their claimed scores converted to the radial ring system would have placed them ninth, thirteenth and fourteenth respectively in the single-operator section. As most of their contacts were with British stations, their logs were particularly useful during the adjudication.

The winners' certificates go to G3JOC in the multi-op section and to G8TFI in the single-op section. G3NNG and G3XDY receive the runners' up certificates in their appropriate sections. *G2HIF*

MULTI OPERATOR SECTION

Posn	Callsign	Score	QSOs	QRA	Best dx	Km
1	G3JOC	1,057	117	AM27	DK1PZ	581
2	G3NNG	1,055	137	ZL23	DK1UV	675
3	G4BRK	883	145	ZM68	DJ9DL	533
4	G8RZP	616	92	AL45	DB4ES	438
5	G3TGE	469	98	ZM77	DF1JC	536
6	G8WAQ	394	92	ZL38	DF3EE	515
7	G4ERO/A	343	41	ZK11	DJ9DL	636
8	G6CQO	318	72	ZL47	DJ9DL	536
9	G8SWB	243	67	YO33	G3BW	372
10	G8OHM	198	54	ZM41	GD2HDZ	261
11	G6APZ	170	41	ZN63	G8EGG	230
12	G3VXK	115	25	YN36	G3JOC	308
13	G4DDL	106	38	AM27	G3JOC	205
14	G3IGQ	105	39	ZL68	G3EHM	220
15	G6BBC	97	49	ZM41	G3JOC	230
16	G8RCK	65	39	ZL29	G4ERO/A	150
17	G4NID	61	23	ZN74	G8TFI	163

SINGLE-OPERATOR SECTION

Posn	Callsign	Score	QSOs	QRA	Best dx	Km
1	G8TFI	768	110	YL29	DL9DL	654
2	G3XDY	621	77	AM77	DJ9DL	419
3	G8ZHP	581	97	ZM29	DL8YQ	516
4	G3UBX	480	98	YM40	EI9Q	337
5	G4JZF	338	80	YM30	G3DAH	267
6	GD2HDZ	259	29	XO68	G3JOC	380
7	G4IOG	253	47	AL54	DF3EE	436
8	G8DKK	230	42	ZL08	DJ9DL	528
9	G8IFT	181	47	YM50	PA0FRE	445
10	G5UM	174	50	ZM35	GD2HDZ	266
11	G4JLG	158	38	YN39	G8AGU	265
12	G3VNQ	124	32	YN39	G6GN	240
13	G3FIJ	115	23	AL05	GW8AAP/P	312
14	G4HAY	107	35	ZL30	GW8AAP/P	257
15	G8ABI/A	98	52	ZL39	G4DKK	190
16	G4AFJ	90	26	ZM05	G6GN	190
17	G8NWR	84	30	YM69	GD2HDZ	260
18	G8BBK	74	22	ZM59	GW8AAP/P	230
19	G8ITS	73	33	ZL40	G8TFI	153
20	G4GGV	62	32	ZL37	GJ4ICD	270
21	G6DER	47	17	ZN33	G6ADC	130
22	G8LXY	27	11	ZL09	G3JOC	148
23	G8NMQ	18	12	ZL37	G8TFI	107

Check log gratefully acknowledged from GW8AAP/P. The entry from G8WPL(?) could not be accepted as there was no callsign, no claimed score, no section etc.

RSGB European Meteor Scatter Contest, 11-12 August 1981

In spite of the publicity throughout Europe well in advance of the event date, the RSGB ms contest during the 1981 Perseids shower had to be declared a non-event owing to a lack of support. Only four valid entries were received.

G3KUX/P claimed the highest score with 31 QSOs, YU3ES claimed 19 QSOs, GJ4ICD 17 QSOs, and YO6AFP 15. The logs from YU2IQ and ON5FF could not be accepted as insufficient data, including the claimed score, had been logged.

The event has now been removed from the contest calendar. *G2HIF*

3·5MHz Field Day 1982 rules

The rules for this year's contest are basically unchanged. However, the HF Contests Committee is concerned that the contest format might not be quite right, judging by the recent lack of enthusiasm for it. Comments and suggestions would be especially welcome this year on the possible restructuring of the contest, and all such ideas will be fully considered by the committee.

1. The general rules for RSGB hf contests, published in the January 1982 issue of *Radio Communication*, will apply.
2. **Eligible entrants.** RSGB members resident in the British Isles. Multi-operator entries will be accepted.
3. **Periods.** 0900-1200gmt, and 1300-1600gmt on Sunday 18 July 1982.
4. **Sections.**
   (a) 15W dc input maximum.
   (b) 5W dc input maximum.
5. **Frequencies.** 3·520-3·570MHz.
6. **Contest call and exchange.** Call CQ FD. Exchange RST plus serial number starting at 001, location (defined by place name) and county code *(see Radio Communication January 1982)*.
7. **Scoring.**
   Portable or mobile stations.....15 points per QSO.
   Fixed stations.....5 points per QSO.
8. **Special conditions.**
   (a) Power. The power for all parts of the station must be derived from dry batteries, accumulators, or "natural" sources (eg solar cells or wind driven generators). The practice of float charging batteries from petrol, gas or diesel driven generators is not permitted.
   (b) Equipment. Entrants using equipment capable of running more power than the specified input power for the section entered must specify how the power limit was adhered to.
   (c) Antennas. The maximum height must not exceed 35ft (11·5m) above ground level.
9. **Logs.** Standard RSGB hf contest log sheets must be used with column (5) headed "Location and county code received".

10. Declaration. The log sheets must be accompanied by the standard RSGB hf contest cover/summary sheet with the declaration signed by the operator responsible for the contest entry.
11. Address for logs. RSGB HF Contests Committee, c/o R. A. Treacher, BRS32525, 79 Granby Road, Eltham, London SE9 1EH.
12. Closing date for logs. Postmarked not later than the Monday 15 days after the end of the contest.
13. Awards. The Houston-Fergus Trophy will be awarded to the leading station in the 15W section. Certificates of merit will be sent to the first three stations in each section.

RSGB SSB Field Day/IARU Region 1 HF Phone Field Day 1982 rules

1. Eligible entrants. Members or groups of members of the RSGB located in the British Isles.
2. The general rules for RSGB hf contests, published in the January 1982 issue of *Radio Communication,* will apply.
3. Period. 1500gmt Saturday 4 September to 1500gmt Sunday 5 September.
4. Sections.
(a) Open. Multi-operator, maximum licensed power. Equipment: one transmitter and one receiver, or one transceiver, plus an additional receiver if desired. Antenna: no restriction.
(b) Restricted. Multi-operator, 200W p.e.p. input maximum. Equipment: only one transmitter and one receiver, or one transceiver. Antenna: only one antenna may be used which must be a single element such as a dipole, long wire, W3DZZ, or trapped vertical, having not more than two elevated support points. No part of the antenna may be higher than 15m above ground level.
Notes (these apply to both sections).
(i) Stand-by equipment is allowed, but it may not be connected at the same time as the main equipment.
(ii) The use of support points for antennas from permanent buildings or structures is not permitted.
5. Location. Each portable station must operate from the same site for the duration of the contest and may not be located in a permanent building or use public mains supply.
6. Power. Power for all equipment may be derived only from a portable generator on the site, accumulators, or batteries.
7. Installation. No equipment or antennas may be installed or erected on the site prior to 24 hours before the start of the contest. This does not apply to the storage of equipment.
8. Contacts. Phone only in the 3·5, 7, 14, 21 and 28MHz bands.
9. Contest call and exchange. Call "CQ Field Day". Exchange RS plus serial number starting with 001.
10. Scoring.
(a) QSO with a fixed station in IARU Region 1 ..... 2 points
(b) QSO with any station outside IARU Region 1 ..... 3 points
(c) QSO with a portable or mobile station in IARU Region 1 ..... 5 points
See Appendix for list of IARU Region 1 countries.
11. Multiplier. Each DXCC country worked on each band gives one multiplier.
12. Final score. The total points scored on all bands is to be multiplied by the total number of different countries worked on each band to give the final score (ie total QSO points × multiplier = final score).
13. Logs. Separate logs are required for each band, together with a check list showing the countries worked on each band. Log sheets are to be headed: date/gmt; station worked; RS and serial number sent; RS and serial number received; operator; new country/multiplier; points. RSGB HF Contest Log Sheets should be used.
14. Declaration. Logs must be accompanied by an RSGB HF Contest Cover/Summary Sheet with the declaration signed by the person responsible for the contest entry.
15. Address for logs: RSGB HF Contests Committee, c/o G3KDB, PO Box 73, Lichfield, Staffs WS13 6UJ.
16. Deadline for logs: postmarked not later than the Monday 22 days after the end of the contest.
17. Awards. The leading station in the Open Section will receive the Northumbria Trophy. The leading station in the Restricted Section, and the entrants placed second and third in each section will receive certificates of merit. Certificates will also be awarded to the stations submitting the leading check log from each continent.
IARU Region 1 will award certificates to the top 10 stations in each section in the combined results table.
18. Any log found to contain more than five unmarked duplicate contacts for which points have been claimed will be automatically disqualified.
Appendix
IARU Region 1 countries include those in Europe, Africa, USSR, Mongolia, ITU Zone 39. For a precise definition refer to the RSGB *Amateur Radio Operating Manual.*

DF Qualifying Event Coventry

Date: 11 July 1982.
Map: OS Sheet 151, 1:50,000 series, Stratford-on-Avon.
Assembly: 1300bst for start at 1320bst.
Location: Chesterton, 6 miles SE of Warwick, ngr355 584.
Competitors requiring tea are asked to notify Mr G. Whenham, Lavernock, 33 Chapel Street, Bishops Itchington, Leamington Spa, Warwickshire CV33 0RB, tel 0926-612 806, not later than 4 July.

Contests calendar

4-6 June	IV Guide Dogs *(Rules in May MOTA)*
5-6 June	NFD *(Rules in February issue)*
13 June	70MHz & SWL *(Rules in May issue)*
19-20 June	3rd EU CW Fraternizing QSO Party *(Rules in June MOTA)*
19-20 June	All Asian (Phone) *(Rules in May MOTA)*
20 June	10GHz Cumulative 1982
20 June	DF Dartford Heath *(Rules in June issue)*
26 June	AGCW-DL VHF/UHF CW *(Rules in March 4-2-70)*
26-27 June	1·8MHz (Summer) *(Rules in May issue)*
27 June	VHF 2m/70cm Phone (WAB) *(Rules for all WAB contests obtainable from D. Roberts, G4FQO, 12 Chestnut Ave, Cranwell, Nr Sleaford, Lincs NG34 8HT)*
1 July	Canada Day *(Rules in June MOTA)*
3 July	Young Operators Field Day *(Rules in June 4-2-70)*
3-4 July	VHF NFD *(Rules in April issue)*
11 July	DF Coventry *(Rules in June issue)*
11 July	10GHz Cumulative 1982
18 July	3·5MHz Field Day *(Rules in June issue)*
25 July	DF South Manchester
1 August	432MHz Low Power *(Rules in June issue)*
8 August	DF Salisbury
8 August	10GHz Cumulative 1982
15 August	70MHz Trophy & SWL *(Rules in June issue)*
22 August	DF Slade
28-29 August	All Asian (CW) *(Rules in May MOTA)*
29 August	ROPOCO 2
4-5 September	144MHz & SWL
4-5 September	IARU 144MHz
4-5 September	SSB FD *(Rules in June issue)*
19 September	10GHz Cumulative 1982
19 September	DF National Final, Colchester/Chelmsford
25 September	AGCW-DL VHF/UHF CW *(Rules in March 4-2-70)*
2-3 October	IARU VHF
10 October	21/28MHz Phone *(Rules in May issue)*
17 October	21MHz CW *(Rules in May issue)*
October/ December	432MHz Cumulatives
October/ December	1,296MHz Cumulatives
6-7 November	144MHz CW
6-7 November	Marconi Memorial CW
7 November	LF CW (WAB) *(See note after 27 June VHF 2m/70cm Phone)*
13-14 November	1·8MHz (2nd)
5 December	144MHz Fixed

DF Qualifying Event Dartford Heath

Date: 20 June 1982.
Map: OS Sheet 188, 1:50,000 series, Maidstone and the Weald of Kent.
Assembly: 1300bst for start at 1320bst.
Location: Shipbourne Common, ngr595 523.
Competitors requiring tea are asked to notify Mr C. Merry, 11 Edith Road, Chelsfield, Orpington, Kent BR6 6JQ, tel 0689 59381, not later than 13 June.

432MHz Low Power Contest rules

0900-1700gmt, 1 August
The transmitter output must not exceed 15W.
The following general rules, published in the January 1982 issue of *Radio Communication* will apply: 1, 2, 3, 4e, 5a, 6a, 7a, 9, 10a, 11a, 12a, 13-26.
All entries and checklogs to: VHF Contests Committee, c/o G. M. C. Stone, G3FZL, 11 Liphook Crescent, Forest Hill, London SE23 3BN.

70MHz Trophy & SWL Contest rules

0900-1700gmt, 15 August
The following general rules, published in the January 1982 issue of *Radio Communication*, will apply: 1, 2, 3, 4e, 5a, 6a, 7a, 9, 10a, 11a, 12a, 13-26.
The VHF Manager's Trophy will be awarded to the leading station overall.
All entries and checklogs to: VHF Contests Committee, c/o J. H. Quarmby, G3XDY, 12 Chestnut Close, Rushmere St Andrew, Ipswich IP5 7ED.

Presentation of the Basil O'Brien Quarter Century Trophy to the Westmorland VHF Group, at a dinner held at the White Hart Hotel, Appleby (proprietor G6BCB) on 6 March 1982. L to r: G3FDW, G6BYH, G3JYP, BRS50130, G3FNM (Region 1 representative), G3SPJ and G4JHV. Photo: G4HYJ

CLUB NEWS

The following is the latest information received by RRs from RSGB affiliated societies, clubs and groups in time for inclusion in this issue. Basic unchanged information on other affiliated organizations will be published in the July 1982 issue.

RSGB affiliated organizations are requested to report all programmes and news items to their regional representatives regularly. Information for inclusion in the **August** issue should reach them by **12 June**, and for the **September** issue by **10 July**.

Club programmes are given in order of date, subject, time and place of the meeting. All callsigns of club secretaries and other contacts are QTHR (correct in the current *RSGB Call Book*) unless otherwise stated.

All clubs welcome visitors and would be pleased to hear from potential new members.

REGION 1—RR W. R. Parkinson, G3FNM, 141 Norris Road, Sale, Cheshire M33 3JR. Tel 061-973 1472.

Accrington (North Western Repeater Group)—17 June, 8pm. Globe Bowling Club, Willows Lane, Accrington. Sec Howard Aspinall, G3RXH.

Ainsdale (AARC)—8, 22 June. Ainsdale Scout HQ. Sec Norman Horrocks, G2CUZ, tel 0704 77604.

Barnoldswick (Rolls-Royce ARC)—2 June (Video tape show—"Microwaves" or "The Secret Listener" titles subject to availability, also present will be Jack Burgess, G3KKP talking about satellites), 23 June (Rally meeting for finalization of arrangements), 8pm. 27 June (Mobile rally, 11am to 6pm). All to be held at the Rolls-Royce Sports & Social Club, Barnoldswick. Sec Leslie Logan, G4ILG, tel Barnoldswick 812288.

Blackburn (East Lancs ARC)—The df contest scheduled for 1 June has had to be cancelled. No details for 6 July. The officers of the club are chairman, Barrie Wilson, G4KFD; treasurer, Harold Dyball; secretary, Pat Thirsk, G8UEW. Pro Norman Jenkin, G4CGT, tel 0254 75037.

Blackpool (B&Fylde ARS)—1 June, 6 July. For venue and programme contact Jim Newland, G5ND, tel 0253 75037.

Bolton (B&DARS)—2, 16 June (Lecture evenings, subjects to be announced), 9, 23, 30 June (Activity nights), 8pm. Horwich Leisure Centre, Nr Bolton. Contact sec Dave Molyneux, G6AEK, tel Atherton 877921 for details.

Leyland (LHARG)—7 June, 7.30pm. Rose & Crown, Ulnes Walton. Sec Arthur Jolly, G4JCO.

Liverpool (Sefton ARC)—The RR is pleased to welcome another newly affiliated club. No programme to hand yet. Meetings are on the first and third Wednesdays, 8pm. Liverpool Prison Officer's Social Club, Hornby Place, off Hornby Road, Liverpool 9. Sec Len Gurney, G4LBJ, tel 051-523 6077.

Macclesfield (M&DRS)—8 June, 22 June (Informal). The club now meets at St Andrews School Hall, Bedford Road, Macclesfield. It has recently acquired its own call, G4MWS. Treasurer, Keith Kelly, G3VKF; chairman/acting secretary, Steve Webb, G3TPW.

Manchester (M&DARS)—2, 9, 16, 23, 30 June, 7.30pm. Newton Heath Community Centre, 203 Droylsden Road, Newton Heath, Manchester. Chairman, Barrie Langfield, G3IOA; treasurer, Vic Buff; secretary, John Dent, G4LRR, G8OWY, QTHR.

Manchester (South Manchester RC)—4 June ("Biotechnology", by Joe Lenatowicj, G8RQZ), 11 June ("Radio clinic"), 18 June ("Home construction techniques", by Trevor Hopkins, G8TYY), 25 June (A mid-summer df contest), 2 July (80-10m activity night), 8 July ("Understanding receiver specifications", by Tim Winter, G4AOK), 8pm. Sale Moor Community Centre, Norris Road, Sale. Informal meetings in the club shack, same QTH, Mondays, 8pm. Sec Dave Holland, tel 061-073 1837.

Mid-Cheshire (MCARS)—Wednesdays. Cotebrook Village Hall, located off the A49 near Tarporley. Net night is Tuesday on 145·200MHz. Chairman Peter Linton, G4PLX; treasurer Alan Allcock, G8ZSK; sec Rick Dodd, G8PNL, tel Winsford 57766.

Preston (PARS)—5/6 June (Participation in NFD), 10 June (Subject to be announced), 24 June (Final preparations for VHF NFD), 8 July ("QRP night", by Jim Hill). St Mary Magdelene Hall, Faringdon Lane, Ribbleton, Preston. Sec George Earnshaw, G3ZXC.

Thornton Cleveleys (TCARS)—4 June (Discussion on NFD), 11 June (Sale and auction of surplus equipment), 18 June (Talk on amateur tv), 25 June (Film or video presentation on a radio topic), 2 July ("Plastics", a talk by Jack Duddington, G4BFH), 8pm. Thornton Cleveleys Sports Centre, Victoria Road, Cleveleys, Sec Mrs Jen Ward, G8YOK, tel Poulton-le-Fylde 890114.

Warrington (UK FM Group Western)—3 June, 1 July, 8pm. Grappenhall Hall Community Centre, Bellhouse Lane, Warrington. Sec Gordon Adams, G3LEQ, tel 0565 4040.

Wigan (Douglas Valley ARS)—3, 17 June (Formal), on 24 June (Informal). Shevington Conservative Club, Shevington, Wigan. Recent changes in the officers are chairman, Geoff Norris, G4KAG; treasurer, Brian Ibbotson; secretary Dave Harrison, G4NDJ, 3 Hallcroft, Birch Green 2, Skelmersdale, Lancs WN8 6QB.

Wirral (WARS)—2 June (National field day briefing), 16 June (DF fox hunt on 2m, organized by C. J. Cawthorne, G4KPU), 7 July (Demonstration of vhf equipment by Gordon Adams, G3LEQ), 7.45pm. Minto House School, Birkenhead Road, Hoylake. Sec Gordon Lee, G3UJX, tel 051-677 1518.

Wirral (W&DARS)—9 June ("Icom and other radio equipment", by Gordon Adams, G3LEQ), 23 June ("Test your rig night", with test gear from various sources), 30 June (The Eileen Medley DF Hunt), 2, 16 June ("D & W'S" at the Greave Dunning and Queens Arms, Oxton respectively), 8pm. West Kirby Concourse Sports Centre. Sec Gerry Scott, G8TRY, tel 051-630 1393.

The RR acknowledges with thanks club magazines/newsletters from Bolton & DARS, Stockport RS, Wirral ARS, and Wirral & District RC.

REGION 2—RR D. S. Smith, G4DAX, Red Roof, Goathland, Whitby, North Yorks YO22 5AN. Tel 094-786 333.

Barnsley (UK FM Group Northern)—6 June, 4 July, 7.30pm. The Royal Hotel, Church Street, Barnsley. Sec G4LUE.

Harrogate Repeater Group (HRG)—Rumour has it that the proposal is with the Home Office at the time of writing, so the end of the waiting may be in sight. Details from G4ATZ.

Leeds (L&DARS)—Mondays, 8pm. Old Hall Golf Club, Woodhall Lane, Calverly, Leeds. The club station has taken another step forward with the acquisition of a good hf rig. With a pair of 6146s in the final, it was purchased with general usage in mind. Sec G8NVP.

Pontefract (P&DARS)—10 June ("VHF antennas", by G8NDF), 24 June (DF practice night), 8 July ("The G4JHQ frequency meter", by G4JHQ), 8pm. Carleton Community Centre. Now that the component fair is over (and what a success that was), shack construction continues apace. Sec is trying to motivate a group to produce a 432MHz repeater in the area. Details from G4ISU, tel 0977 72784.

Wakefield (W&DARS)—15 June (RR2, G4DAX), 29 June (On the air/natter night), 8pm. Holmfield House, Denby Dale Road, Wakefield. Sec G4BLT, tel Wakefield 255515.

A member of one of the local clubs has enquired why his club was not in this column. I had to explain that if the club sec does not write, the RR cannot make up an entry. If you are a club sec, and you woke up this morning with a knife in your back, it is probably my fault! Of course, you could avoid it by dropping me a line. *RR2.*

REGION 3—Acting RR H. S. Pinchin, G3VPE, 61 Cole Bank Road, Hall Green, Birmingham B28 8EZ. Tel 021-777 1320.

Birmingham (Midlands ARS)—15 June ("Demonstration of 10GHz", by Gerry Farrance, G3KPT, and Roy Warrender, G8ASW), 7.30pm. 294a Broad Street, Birmingham B1 2DS. Sec G8BHE, tel 021-422 9787.

Birmingham (South Birmingham RS)—Thursdays (HF night on the air), Fridays (Construction and morse classes), 7.30pm. 7 July, 7.45pm. Hampstead House, Fairfax Road, West Heath, Birmingham B31 3QY. Sec G8RGQ, tel 021-459 8312.

Bromsgrove (B&DARC)—11 June, 25 June (QRP meeting), 26 June (Bromsgrove carnival—demonstration station), 8pm. Avoncroft Art Centre, Bromsgrove. Club net Wednesdays, 144·850MHz, 8pm. Sec G4LVK, tel 021-445 2088.

Hereford (HARS)—18 June (Informal meeting), 19 June (RSGB hf convention, Oxford), 2 July, 8pm. Civil Defence HQ, Gaol Street, Hereford. Sec G4CNY, tel Hereford (0432) 3237.

Malvern Hills (MHRAC)—8 June (Construction contest), 7.30pm. The Red Lion Inn, St Ann's Road, Great Malvern. Sec G4GFX, 9 Wyche Road, Malvern, tel Malvern (06845) 62900.

Redditch (RRC)—10 June (Aerial working party), 24 June (Natter night), 8pm. WRVS Centre, Ludlow Road, Redditch. Sec G3EVT, tel Alcester (0789) 762041.

Shrewsbury (Salop ARS)—12 June (Demonstration station at West Mid showground), 17 June (Demonstration of sstv by Mike Wilde), 24 June ("RSGB", by David Evans, G3OUF, general manager), 1, 8 July, 8pm. Albert Hotel, Smithfield Road, Shrewsbury. Sec G6AKE, tel Shrewsbury (0743) 66969.

Solihull (SARS)—15 June, 7.30pm. The Manor House, High Street, Solihull. Club nets (G3GEI), Fridays, 9.30pm on 1,960kHz and (G8ZLJ), Sundays, 9pm on S19 or next lowest vacant channel. Morse classes available. Sec G4JDL.

Stratford-upon-Avon (S-uponA&DARC)—14 June (Communications by satellite—film), 28 June (Natter night), 7.30pm. Bearley radio station. Talk-in on S22. Programme sec G6CWK, tel Stratford (0789) 68863.

Sutton Coldfield (SCRS)—14 June ("Early days of radio", by Fred Ward, G2CVV), 28 June (Natter night), 7.30pm. Central Library, Sutton Coldfield. Club net Mondays, except on meeting nights, 145·2MHz, 8pm. Sec G8TUR, tel 021-353 2061.

Telford (T&DARS)—9 June (Constructing aerials for 2m—practical session), 16 June ("Causes and cures of tvi", by Martyn Vincent, G3UKV), 23 June (DF evening—see sec), 30 June (Final preparations for NFD), 7 July (G3ZME on the air), 14 July ("PSUs and PAs for vhf", by Mike, G4NKC), 7.30pm. Phoenix Centre, Webb Crescent, Dawley. Sec G8UGL, tel Telford (0952) 584173.

Members of the Harrogate College RS: (standing, l to r) Sarah Thompson, G6GGH; Richard Horton, G3XWH, head of physics; Maria Iacovou, G6GGI; David Andrews, G4CWB, director of music; and Fiona Morris (awaiting licence); (seated, l to r) Dione Folkard, G6GGJ and Deborah Collins, G6GGK. In addition, one other yl at this girls' boarding school is awaiting her licence and three others are studying for the RAE. An exhibition station, GB2HC, will be operating on 24-25 June from their new purpose-built shack, and many dx contacts are expected

Walsall (WARC)—23 June ("Public service communications", by Martin Swift, G4NCE), 7 July (Arrangements for Walsall Show—demonstration station), 8pm. Forest Community Centre, Hawbush Road, Leamore, Bloxwich. Club net Fridays, 28·025MHz cw, 8pm, and 3·70MHz ssb, 9pm. Sec G4GKC, tel Walsall (0922) 31675.

Wolverhampton (WARS)—7 June (Surplus sale), 14 June (Natter night), 21 June (Questions session), 28 June (Treasure hunt—see Ken, G8MPB), 5 July, 8pm. Wolverhampton Chamber of Commerce & Industry, 93 Tettenhall Road, Wolverhampton WV3 9PE. Sec G8EDG, tel Wolverhampton (0902) 763617.

Worcester (W&DARC)—21 June (Informal evening at the Old Pheasant, New Street, Worcester), 5 July (Droitwich rally planning and job organization), 8pm. Odd Fellows Club, New Street, Worcester. Sec G8TZE, tel Tewkesbury (0684) 293890.

REGION 4—RR M. Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. Tel Derby (0332) 556875.

Bolsover (BARS)—Wednesdays, 30 June (XYL evening), 7 July (Talk on vintage radio, by G4DVW), 8pm. The Angel Hotel, Bolsover. Sec David Brocklehurst, G8KIF, tel Chesterfield 811666.

Derby (D&DARS)—2 June (Junk sale), 9 June (Technical quiz), 16 June (Robot slow scan equipment), 18 June (Vintage night), 23 June (Barbecue at Drum Hill), 30 June (Night on the air), 7.30pm. Top Floor, 119 Green Lane, Derby. Sec Jenny Shardlow, G4EYM, tel Derby 556875.

Lincoln (LSWC)—9 June ("DIY", by G3VRD), 14 June (Visit to Lincolnshire police headquarters, 7pm), 23 June ("Data transmission", by G8HMZ), 7.30pm. City Engineers Sports & Social Club, Waterside South, Lincoln. Sec Chris Jones, G6AJL.

Melton Mowbray (MMARS)—18 June (Visit to Radio Trent), 7.30pm. St Johns Ambulance Hall, Asfordby Hill, Melton Mowbray. Sec Richard Winters, G3NVK, tel Melton Mowbray 63369.

Newark (N&DARC)—3 June (Foxhunt), 7.30pm. Palace Theatre, Appleton Gate, Newark. Sec Roger Hiscock, G4MDV.

Only reports from five clubs this month. Please club secs, can I have a copy of your programme! *RR4.*

REGION 5—RR J. S. Allen, 77 Rosslyn Crescent, Luton LU3 2AT. Tel 0582 508515 or 058 221151 ext 303, during working hours.

Bedford (B&DARC)—Wednesdays. Club shack, Ravensden. Further details from sec G8ATI.

Cambridge (C&DARC)—4 June (Junk sale at Comberton Village Hall), 11 June (Informal and morse class), 18 June (Talk on model aircraft by Brian Roberts, G6CPH), 7.30pm. Coleridge Community Centre, Radegund Road, Cambridge. Sec G8JKV.

Leighton Buzzard (LLARC)—14 June (Visit of RR5), 7pm. Van Dyke Community College, Room A64. Sec G8GIK.

Luton (Kent Process Controls ARC)—2 June (TV demonstration). KPC Sports Club, Tenby Drive, Luton. Sec G3DOT, chairman G3TLE.

Peterborough (GPARC)—24 June (Preparations for VHF Field Day), 7.30pm. Southfields Junior School, Stanground. Sec G8ZVW.

St Neots (S&DARS)—14 June (Visit to Texas Instruments), 28 June (Visit to Sandy Heath transmitter). Details from sec G4FOH.

Shefford (S&DARS)—3 June (Final preparations for NFD), 10 June (Junk sale), 17 June (Debriefing after NFD), 24 June (DF hunt). Sec G4DAQ.

Wellingborough (Nene Valley RC)—Wednesdays. The Royal, Knox Road, Wellingborough. Details from G6CZV or G6CPX.

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HP13 7EA. Tel Penn (049481) 4240.

Aylesbury Vale (AVRS)—15 June, Stone Village Hall, 29 June (Informal meeting at the Red Lion, Bierton), then every fourth Tuesday, 8pm, in the saloon bar. Sec M. J. Marsden, G8BQN, tel 0296 641783.

High Wycombe (Chiltern ARS)—Last Wednesday in each month, 8pm. New venue—Sir William Ramsay School, Science Block Lecture Theatre, Hazelmere. Talk-in on S22 from 7.30pm. Details from one of the two secs, G3NCL, or G4KVA.

Harwell (HARS)—15 June (TBA), 7.30pm. East Wing Room, AERE Social Club. Details from Ann Stevens, G8NVI.

Maidenhead (M&DARS)—15 June (Preparation for VHF NFD). Please note new sec Roger Hemmings, G3VCT, tel Bourne End 21036.

Oxford (O&DARS)—Please contact new sec Richard Talbot, G4IWZ, Rush Common House, Dorchester Crescent, Abingdon, Oxon, for meeting details.

REGION 7—RR Pat Walker, G8HMG, 12 Brownlow Road, Redhill, Surrey RH1 6AW. Tel Redhill 64035.

Biggin Hill (BHARC)—A new constitution for BHARC has been adopted. 22 June (The RSGB film "Microwaves" will be shown), 8pm. Biggin Hill Memorial Library. Sec Ian Mitchell, G6EMW, tel Biggin Hill 75785.

Croydon (Surrey Radio Contact Club)—First and third Mondays in each month, 8pm. TS Terra Nova, 34 The Waldrons, Croydon. Sec Ray Howells, G4FFY, tel 01-642 9871.

Crystal Palace (CP&DRC)—19 June ("Amateur radio direction finding", by Peter Lisle), 8pm. Emmanuel Church Hall, Barry Road, London SE22. Sec Geoff Stone, G3FZL, tel 01-699 6940.

Redhill (Reigate ATS)—15 June ("VHF dx and meteor scatter", by G3WZT), 8pm. Constitutional & Conservative Club, Warwick Road, Redhill. Sec Chris Barnes, G8FEE, 25 Hartswood Avenue, Reigate RH2 8ET.

Thames Ditton (Thames Valley ARTS)—1 June ("Fun on 30m", by Victor Brand, G3JNB), 8pm. Thames Ditton Library, Watts Road, Giggs Hill, Thames Ditton. Sec Julian Axe, G4EHN, tel 01-946 5669.

Club secretaries! Even if you do not have a newsletter, please try to let me know your programmes for *Rad Com*. A phone call will do, but by the date shown at the top of this section please.

REGION 8—RR K. A. Crouch, G8KEN, 14 Victoria Road, Capel-le-Ferne, Folkestone, Kent CT18 7IR. Tel 0303 55241.

Brighton (B&DRS)—Every second Wednesday, 16 June (Evening rally), 7.45pm. 47 Cromwell Road, Hove. Details from Gee Goodrich, G4NLA.

Burgess Hill (Mid-Sussex ARS)—3 June (Please note Marle Place is closed and it is hoped to visit Peas Pottage Met Station), 17 June (Windmills evening at Jack & Jills Windmills, Clayton). Bob Hodge, G4MMI, is acting sec/programme sec, and his address is Corner House, Mana Gardens, Hurstpierpoint, Hassocks BN6 9UG, tel Hurstpierpoint 833559, for details of club activities.

Canterbury (EKRS)—First and third Thursday in each month, 7.30pm. Please note permanent change of venue to The Cabin, Kings Road, Herne Bay. Details from Dereck, G8ELS.

Dover (SEKYMCAARC)—2 June (Natter night), 9 June (RNLI talk), 16 June (TBA), 23 June (Norman, G4MHS, "Caveat emptor?"), 30 June ("10MHz aerials", by G3OWO), 7 July (Natter night), 7.30 for 8pm. YMCA, Dover. Morse classes, 7pm prior to club meeting. The club also runs an RAE course on Mondays and morse on Tuesdays. Club now has a new hf rig with the new bands, so come and try it. Further details from G8EGT, G3VSU, or G4EGQ.

Eastbourne (Southdown ARS)—7 June (Open forum and demo of equipment), 5 July (Open air meeting with food at Butts Brow). Chasley Home, South Cliff, Eastbourne. Details from sec, tel 0323 643463.

Hastings (HERC)—Wednesdays, 16 June (Summer social), first Wednesday in each month (Committee meets at 479 Bexhill Road), second, fourth and fifth Wednesdays in each month (Micro nights at 479 Bexhill Road), third Wednesday in each month (Main meeting, West Hill Community Centre), 7.30pm. Contact G8VEA, tel Hastings 216516.

Horsham (HARC)—3 June (TBA), 1 July (Homebrew evening), 8pm. Guide HQ, Denne Road, Horsham. Details from Tony Wadsworth, G3NPF.

Kent Repeater Group—11 June (AGM, start 8pm sharp. This meeting is open to all members and non-members who are interested in the repeaters run by the KRG. These are GB3KN and KS on 144MHz, GB3NK, CK, EK and SK on 432MHz. Your support is always requested and welcomed at the AGM.) Further information on this and KRG matters from G3MDO.

Medway (MARTS)—6 June (visit to Bredhurst Cattery), 27 June (visit to Science Museum). Details of the club and its activities from Ruby Sivyer, G6DJV, tel Medway 61927, after 6pm.

Tunbridge Wells (West Kent ARS)—Fridays, 11 June ("Measuring ssb output power", by Ian Keyser, G3ROO), 25 June ("Dxpedition to Andorra", by Roger Hood, G3BIA), 9 July (Junk sale). Adult Education Centre, Monson Road, Tunbridge Wells. Tuesdays (Informal). Drill Hall, Victoria Road, Tunbridge Wells. Details from Brian Castle, G4DYF.

Worthing (W&DARC)—1 June (Robin, G3ZYE, talks about final arrangements for field day), 8 June (Rag chew and discussion on HF Field Day), 15 June (Don, G4JHM), 22 June (Mobile rally, Whiteways Lodge, Bury, 7pm), 29 June (Al G3FXP), 6 July (Question time and discussion on VHF Field Day), 7.30 for 8pm. Pond Lane Amenity Centre, Worthing. Details from Joyce, tel Worthing 63062.

Four clubs have not sent me any information since that in the January issue, and others very spasmodically. I wonder how they keep their members? They will all be listed in July's issue showing the latest information available to me. I will be in attendance at the Brighton Rally so if you wish to see me come along to this fine rally. *RR8.*

REGION 9—RR W. J. Colclough, G3XC, Highview, Indian Queens, St Columb, Cornwall TR9 6LL. Tel 0726 860485.

Camborne (CRAC)—3 June (AMSAT UK), 21 June (Computer section. A floppy disc tutorial by Des Old, G3CZZ). SWEB Pool, Camborne. Pro is now Simon, G6DFE, tel 0736 3948.

Exeter (EARS)—14 June (Talk on computers), 7.30pm. Community Centre, St David Hill, Exeter. First, third and fourth Monday in each month (Informal). The Scout Hall, Emmanuel Road, Exeter. Details from pro Geoff Draper, 1 Carlyon Close, Heavitree, Exeter EX1 3AZ.

Saltash (S&DARC)—4 June ("SSTV", by Peter Burnett, G4BLL). Toch H, Burraton, Saltash. Details from Kevin Hall, 12 Rashleigh Avenue, St Stevens, Saltash, Cornwall PL12 4NS.

Torbay (TARS)—Fridays, 7.30pm. Bath Lane, rear of 94 Belgrave Road, Torquay, Torbay. The annual dinner was well attended, with a total of 132 members and guests. Preparations are well in hand for NFD and other outdoor activities. For the rally on 29 August at the ITT Social Centre S22 will be used as the talk-in channel from 10am. Hot meals and bar facilities will be available. For further details contact G4DZH, tel 0803 523063.

REGION 10—RR P. A. Jones, GW4HAT, 68 Pastoral Way, Tycoch, Swansea SA2 9LY

Aberystwyth (ARSGBG)—This group has been meeting for a number of years but this month receives its first publicity in these pages! Due to the terrain and scattered amateur population this group meets on a very informal basis approximately every six weeks at The Bay Hotel on the seafront at Aberystwyth. The forthcoming meetings are 1 June, 13 July and 24 August. All interested operators and swls within the locality are urged to give this group their support. The group convenor is Simon Mee, GW4CTV, tel Aberystwyth 828365.

REGION 11—RR B. H. Green, GW2FLZ, 1 Clwyd Court, Tan-y-Bryn Road, Colwyn Bay, Clwyd, LL28 4AH. Tel 0492 49288.

Colwyn Bay (Conwy Valley ARC) (GW6TM)—10 June (AGM, evening preceded by a sale of surplus radio equipment), 7.30pm. Green Lawns Hotel, Bay View Road, Colwyn Bay. Sec J. N. Wright, GW4KGI, tel 0745-823674.

Dolgellau (Meirion ARS)—3 June (Talk by Lee Francis, GW3SON), 7.30pm. Royal Ship Hotel, Dolgellau. Sec Mrs Jean Jones, GW4KYK, tel Tywyn 710402.

Rhyl (R&DARC)—10 June, 24 June (Communication exercise), 7.30pm. Ambulance Station, Rhyl. Sec B. Jones, GW8OYT, 6 Rhodfa Maes Hir, Rhyl, Clwyd, tel 0745 37284.

REGION 13—RR A. B. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. Tel 0592 200335.

Glenrothes (G&DARC)—5/6 June (HF NFD), 16 June (Visit to Forth Road Bridge), 20 June, 7.30pm. Clubrooms, Provosts Land, Leslie, Fife. "SSTV" by Dick Wilson, GM4BIT, was unavoidably cancelled, but will be programmed for later in the year. Details from GM8ZTV, tel Kirkcaldy 203582.

Mr David Anderson, GM4JJJ, has recently been appointed as area representative for Fife region. He can be contacted on Saline (038-384) 705.

REGION 16—RR T. D. Howe, G3PLF, 18 Vange Hill Drive, Basildon, Essex SS16 4DD. Tel 0268 24453.

Braintree (B&DARS)—7 June ("History of Barscom", by Bob Willicombe), 21 June ("VSWR and dummy loads", G3PEN). Braintree Community Centre, Victoria Street. Details from Alan Williams, G6CIV, tel Silver End 83516.

Chelmsford (CARS)—1 June (Constructors competition). Marconi College, Arbour Lane. Details from Andrew Mead, G4KQE, tel Silver End 83094.

Colchester (CRA)—10 June ("Sailing round the Essex coast", by G4JIG), 24 June ("Measurement of frequency and wavelength", by G3FIJ). Colchester Institute, Sheepen Road. Details from Frank Howe, G3FIJ, tel Colchester 70189.

Ipswich (IRC)—9 June (ESWR post-mortem and ragchew), 30 June (Final planning for VHF NFD). Club Room, Rose & Crown, Norwich Road. Details from Jack Tootill, G4IFF, tel Ipswich 44047.

Martlesham (MRS)—2 June ("Noise figure measurements", by members of MRS), 7 July ("RF hazards", by G3SEK). British Telecom Research Labs, Martlesham

Heath. Visitors are welcome but must contact G3ZNU for security clearance.

Norfolk (NARC)—2 June (Final HF NFD briefing), 9 June (Informal), 16 June ("The non-technical talk of 1982", by G4LDG), 23 June (Informal), 30 June (Final VHF NFD briefing). Crome Community Centre, Telegraph Lane East. Details from Paul Gunther, G8XBT, tel Norwich 610247.

Pye (PRC)—Lowestoft—3 June (Meeting to discuss VHF NFD). Details from A. Seago, G4KDL.

Stowmarket (S&DARS)—7 June ("Antenna basics", by G3XAP). Red Cross Hut, Station Yard. Details from J. Lowe, G8SCB, tel Needham Market 721296.

Vange (VARS)—3 June (Junk sale), 10 June ("Slow scan", by G3LUI), 17 June (Natter night), 24 June (VHF NFD discussion). Main Hall, Barstable Tennants Community Association, Long Riding, Basildon. Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

REGION 17—RR H. G. Cunningham, G8FG, 235 Station Road, West Moors, Wimborne, Dorset BH22 0HZ. Tel Ferndown (0202) 876018.

Basingstoke (BARC)—16 June ("The commercial approach to communications", by G4EFY), 7.30pm. Chineham House, Popley, Basingstoke. Sec G6CPA, tel Tadley (07356) 4964.

Bournemouth (BRS)—18 June (Demonstration of latest equipment by Wood & Douglas), 2 July ("Police radio communications", by Mr Duthie), 7.30pm. Kinson Community Centre, Kinson, Bournemouth. Sec G4EKE, tel Ferndown (0202) 877945.

Fareham (F&DARC)—Wednesdays, 9 June ("The Ferguson tx concept", by G3GVM), 23 June ("The oscilloscope employed in fault finding", by G4ITF), 7 July ("FSTV", by G8VOI), 7.30pm, Porchester Community Centre. Sec G4ITG, tel Fareham (0329) 234904.

Guernsey (GARS)—Tuesdays and Fridays, 8pm. The Lodge, La Carbinerie, St Martins. 10 July (Summer dinner at the White House Hotel, Hurn). Sec GU6CLY, tel 0481 21197.

Southampton (SARS)—Wednesdays, 9 June ("Satellites", by G3OZT), 7.30pm. Bitterne Park Secondary School, Dimond Road, Bittern, Southampton. Details from G4LDK, tel Burlesdon (042121) 3451.

Weymouth (South Dorset RS)—First Tuesday in each month, 7.30pm. Civilian Canteen, Army Bridging Camp, Wyke Regis, Weymouth. At the recent AGM the following officers were elected: chairman, G3SDO; secretary, G3ZGP; treasurer, G3JRL; committee members, G3YWG and BRS48040.

REGION 18—RR W. A. Ricalton, G4ADD, 4 South Road, Longhorsley, Morpeth, Northumberland NE65 8UW. Tel 067 088 259

Morpeth (Northumbria ARC)—Thursdays, 7.30pm. Old Telephone Exchange, Ellington. 27 June (Grand junk sale, picnic, Hagg House, Ellington). Sec Ian Gibbs, G4GWB, tel Morpeth 790417.

Tyneside (TARS)—Now in its eleventh year. Mondays, 7.30pm. Community Centre, Vine Street, Wallsend. Sec James Dingwall, G4ILW, tel 872661.

REGION 19—R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ. Tel 01-989 6741.

Cheshunt (C&DRC)—2 June (Talk on weather satellite photos by Dennis, G3TIK), 9 June (Natter night), 16 June (Video disc player, demo by Nick,

Angus McKenzie, G3OSS, (centre) officiating at the raffle after giving the annual G3PAO Memorial Lecture to the Verulam ARC, with chairman G3JKS on left and secretary G4DJX on right. *Photo:* **G3PZF**

G8DJU operating the Cheshunt & DARC's station at the Hoddesdon Girl Guides "Thinking Day" event in February. Photo: ***Stephen Austin Newspapers Ltd***

G8NDR), 23 June (Natter night), 30 June (144MHz portable on Baas Hill Common), 8pm. Church Room, Church Lane, Wormley, Herts. Sec R. Gray, G6CNV, tel Dane End 203.

Chiswick (ABCARC)—15 June (The new licence schedule—discussion), 7.30pm. The Committee Room, Chiswick Town Hall, Chiswick High Road, W4. Sec G3GEH, tel 01-992 3778.

Edgware (E&DRS)—5/6 June (NFD at Copthall Playing Fields), 10 June (Quiz by G3PSP), 24 June (Informal and VHF Field Day briefing, check venue), 8pm. 145 Orange Hill Road, Burnt Oak, Edgware. Sec G4HMD, tel 952 6462. Slow morse is taught at this club.

Harrow (RSH)—4 June (Informal/practical), 11 June (Talk on orienteering), 18 June (Junk sale), 25 June (Informal/practical), 8pm. Roxeth Room, Harrow Arts Centre, High Road, Harrow Weald, Middlesex. Please park prettily in car park! Details from C. Friel, G4AUF, tel 01-868 5002.

St Albans (Verulam ARC)—22 June ("Operating techniques on the hf bands", by Derek Purchase, G3LXP), 7.30pm for 8pm. Charles Morris Memorial Hall, Tyttenhanger Green, Nr St Albans. Informal meetings held second Tuesday in each month at RAFA HQ, New Kent Road, St Albans. Publicity officer G3VJO, tel Redbourn 2761.

Southgate (SARC)—10 June ("Marconi the man", by Betty Hauce of Marconi Ltd, historian), 7.30 for 8pm. St Thomas's Church Hall, Prince George Avenue, Oakwood, London N14. Sec John, G8EWG.

Stevenage (S&DRS)—3 June (Talk on hf antennas by G3XAP), 17 June (Rig test evening with British Telecom), 8pm. British Aerospace Ltd, Site B, Staff Canteen, Gunnels Wood Road, Stevenage. On 1 July the club is holding a "beginners class" at the Friends Meeting House, Handside Lane, WG City (next to Barn Theatre), at 8pm, details from Terry Bailey, G6CRF, tel Stevenage 62860. This is an idea other clubs might like to copy. *RR19.*

SW Herts UHF Group (SWHUG)—This group runs the uhf repeater GB3HR, and the shf beacon GBSWH on 10GHz. The group also hold authority to operate a 1,297MHz beacon/repeater for the RSGB, which is being constructed. For the past year, much of the work of this group has been devoted to negotiating with the local authority and land valuation office to try to get the rates for the antenna mast reduced to a reasonable sum. These negotiations appear to be nearing completion and hopefully this will mean that the group will be able to afford to stay on the Bushey Heath site in Hertfordshire.

Much work has also taken place on the Mk3 version of GB3SWH, and hopefully by the time this is read, the group's 10GHz beacon will be operational once again from their second site on Bushey Heath. The group would like to acknowledge the considerable help given to it by Les, G3BNL.

Talks and demos are available on these projects, and enquiries should be sent to the sec, Trevor Groves, G4KUJ.

Wanstead (ELGRSGB)—20 June (Film (to be announced) plus junk sale), 3pm. Wanstead House, The Green, London E11. Programme sec J. Body. G6FPC, tel 519 7855.

REGION 20—RR B. L. Goddard, G4FRG, 2 Greenfield Park, Portishead, Bristol BS20 8NQ. Tel 0272 848140.

Bristol (BGRSGBG)—The Bristol Group's main event of the year is the Longleat Mobile Amateur Radio Rally on Sunday 27 June at Longleat Park, Warminster. 28 June (Dr J. Allaway, G3FKM, will be talking to the group about Society matters), 7.30pm. Queens Building, Bristol University. Details from Chris Short, G8GLQ, tel 0272 621253.

Bristol (Shirehampton ARC)—Fridays, 11 June (HF NFD "inquest"), 18 June ("QRP operating", by G3YHV), 25 June (Final details of the club's activity at Longleat, and planning for another 144MHz df hunt at Blaise Castle), 7pm. Twyford House, High Street, Shirehampton. Details from Ron Ford, G4GTD.

Cheltenham (CARA)—3 June (Talk on Severn Sound Radio), 18 June (Natter night), 1 July ("Why bother with vhf?", by Tom Douglas), 7.30pm. The Old Bakery, Chester Walk, Clarence Street, Cheltenham. Details from John Holt, G3GWW.

Gloucester (GARS)—Thursdays, 7.30pm. Chequers Bridge Centre, Painswick Road, Gloucester. CW practice and informal meetings on most Thursdays. Late details will be given on GB2RS. 5-6 June (NFD at Hempstead). Details from Tony Martin, G4HBV.

Portishead (Gordano ARC)—23 June ("Raynet in 1982", by Brian Goddard, G4FRG), 7.30pm. Ship Hotel, Down Road, Portishead. Details from John Davies, G3LJD.

Yeovil (Y&DARC)—3 June ("Electromagnetic radiation", by G3MYM), 10 June ("Double your morse speed overnight", by G3KSK), 17 June ("A club propagation research project", by G3MYM), 24 June (Committee meeting and natter night), 7.30pm. Building 101, Houndstone Camp, Yeovil. Details from Don McLean, G3NOF, tel 0935 24956.

MEMBERS' ADS

CONDITIONS OF ACCEPTANCE

These subsidized flat-rate advertisements are accepted as a service to members of the RSGB only. They must be submitted on the Member's Ad form printed on the back of a *recent* address label carrier used to mail *Rad Com* to the advertiser: this will automatically provide proof of membership and should not be more than two months old. No acknowledgment of receipt will be sent, and advertisements not clearly worded or punctuated, or which do not comply with the conditions of acceptance, will be returned. No correspondence concerning this service will be entered into.

Trade or business advertisements, even from members, will not be accepted for "Members' Ads" but should be submitted as classified or display advertisements in the usual way. Traders who are members must enclose a signed declaration that the items for sale or wanted are part of, or intended for, their own personal amateur station.

The RSGB reserves the right to refuse advertisements, and accepts no responsibility for errors or omissions, or for the quality of goods offered for sale.

Advertisements for citizens band equipment will not be accepted.

Warning. Members are advised that they should, as far as possible, ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The "purchase" of goods legally owned by a finance company could result in the "purchaser" losing both the goods and the cash paid.

The current rate is £1 for 40 words or less: advertisements containing more than 40 words will cost an additional £1 for every additional 40 or less words. Each advertisement must be accompanied by the correct remittance, either as a cheque or postal order made payable to Radio Society of Great Britain.

Closing dates in 1982 for issues in brackets, are **17 June** (August), **15 July** (September), **25 August** (October), **23 September** (November), **21 October** (December), **18 November** (January 1983), **16 December** (February 1983).

Post to: MEMBERS' ADS, RSGB, 88 BROOMFIELD ROAD, CHELMSFORD, ESSEX CM1 1SS
Do not post to RSGB HQ or Advertising officer.

FOR SALE

Eimac 4CX300A with base, both brand new, unused, best sensible offer. New unused BAY96 varactor diodes, £2.50 each incl p&p. G3RNV, QTHR.

Yaesu FT227RB with up/down scan mic, comp with handbook, packing, one owner since January 1981, £200 ono. G8XTT, QTHR. Tel Wilmington (Devon) 616.

EK105D electronic keyer, 7 by 3·5 by 1·5, £11. G3HVA NOT QTHR. Tel Basingstoke 780482.

Pocketphone 70, fm, R6, 21, 23, toneburst, spare nicad charger, £65. Olympic fm high band R6, 21, £50. Marconi sig gen, fm/a.m., 1·5/220MHz, £40. Two transistor Pye base rxs, £10 each. One tx, high band, £15. G8LGB, QTHR. Tel 0223 248650.

Apple 2 plus (autostart rom) microcomputer, 48K ram, bw modulator, £450 ono. Microhush 100 printer (40 column) with interface for Apple, £75. G8ZTN. Tel Lyme Regis (02974) 2026, day, Chard (04606) 3814, evenings.

FT101E, spec cw filter, speech processor, fan, mic, manual, £300. KW Atlanta, external vfo, Shure mic, spare valves, manuals, £250. G4JCY, QTHR. Tel 0444 451522 (West Sussex).

2m SR9 rx, 5/8 whip mag mount, mains psu, £40. Tel Rayleigh 747225, after 6pm.

Eddystone 888A cw S-meter, spkr, plinths, £75. Europa C 2m transverter, repeater shift, plugs into FT101, £65. RS 200W isolation transformer, £10. New QQE06/40 valve, £5. Mains transformer output 12V, 100VA, 24V, 200VA, £10. G3IDW, QTHR. Tel Swindon 822055.

IC240, orig packing, £120. Heathkit SW717 gen cov and amateur bands rx, £45. MM 2m converter, 2-4MHz, suits SW717, £15. Pye Bantam hb/fm, some xtals, mic, needs attention, £20. KW2000 dc psu, £15. G4MMI. Tel Brighton (Sussex) (0273) 833559.

KW109 Supermatch, atu, swr/power, antenna switch, dummy load, matches 30-2,500Ω up to 1kW p.e.p., bargain, £99. Buyer collects. G4BGY, QTHR. Tel 01-777 9061.

Trio 2400 2m fm handheld tx/rx, as new, used little, 18 months old, American 5/8 telescopic whip, giving 10dB gain, £145. G8XHH, QTHR. Tel Paul, Doncaster (0302) 530109.

Eddystone 770S vhf/uhf rx, case, £95 ono. Pye Bantam, S20, R5, R7, comp with case, £30. Five RCA OR2000 seven-seg tubes, RCA drivers, £10. 400MHz wideband 10W strip line amp, chip caps, transistors, £10. G8NTH. Tel Guildford 34954.

Starphone SF1, wkg on RB0, nicad, charger, circuit, leather case, £40. QQV06/40S, new, £7 each incl carriage. *Wanted:* handbook or circuit diagram for KP202 handheld, to buy or copy. N. Taylor, G4DYN, 18 Brant Road, Scunthorpe. Tel 0724 65050.

Liner 2, psu, rx preamp, extra range, good wkg order, 4m Ultra 4B6 handheld, new valves QQV06-40, 4X150A, 15 unused polarized relays by Siemens, ideal for tp enthusiast, offers. G3SLI, QTHR. Tel Reading (0734) 479850.

Philips FM321 70cm synthesized tx/rx, £160. Ext vfo for TS120/130, £55. Datong FL1, £40. All ono. G4HQX, QTHR. Tel 0453 45461, or 0453 833411.

FT707 hf mobile, 10-80m, comp with mobile mount, FC707 atu, FP707 power supply, FV707DM digital vfo, YM38 mic, £700 ono. Cushcraft A3 3-el beam, brand new, cost £160, sell £125. G4JKM, QTHR. Tel 0452 411409, after 6pm.

Oscilloscope EMI WM26, incl handbook, high gain amplifier, dc to 50MHz, good wkg order, £60. G4KIO. Tel 01-397 6814.

Creed 444, £65. Pye AM10F base rx, £20. W30AM, lb 3ch, £45. AM10B lb, 6ch, £20. GEC RC660 hb 10ch, £35. Creed 75, £28. Pye motorcycle Westminster a.m., £25. Marconi TF791 deviation meter, faulty, £15. G8EPR, QTHR. Tel Bewdley 403773.

Yaesu FRDX400S, FLDX400, vgc, £155 each. Lots spare valves. Europa B hf 2m transverter, £50, or exchange FTDX401, TS515, TS520, TS120S or w.h.y? All must be vgc. GW8ZZQ NOT QTHR. Tel 0286 5322 (N Wales).

IC24G, immac cond, £145. Belcom Liner 2, with preamp, £85. 2m 15W pa, with psu, two RS type coaxial relays, £20. G4KTP, QTHR. Tel 0207 502336.

Miles per gallon computer by Mobilec, £20. Electronic ignition kit, SX make, fits most cars, £17. Brown, GW3OIM, QTHR. Tel c/o Bangor 2672, or Holyhead 2304, office hours.

TR2300 rev rpt, nicads, charger, case, etc, as new, in box, £135. G6FEO NOT QTHR. Tel Rugby (0788) 62619.

SEM atu, 160-10m, 15-1,500Ω, balanced or unbalanced at up to 1kW, inc SEM Ezitune noise bridge, eight months old, £50. Mains transformers, 13·5, 27V, secondaries 5·5A, £8. G4DTI, QTHR. Tel Wokingham 792102, after 6pm.

Yaesu FT227R, used little, 5/8 mag mount whip, bargain, £100. Ringo Ranger with considerable amount of low loss 50Ω down lead, £25. G4MGF, QTHR. Tel 0843 22343.

Bulletin/Radio Communication 1964-80, most years comp; *SWM* 1971; *Microwave Journal* 1967-81, odd ones missing; *VHF Communication* 1969-76, mostly comp; *Mobile News*, every issue April 1970-Feb 1976, offers. Buyers arrange collection. SAE enquiries please. G8AXC, QTHR.

110 baud ASCII teletype, stand, keyboard, paper tape reader, £70 ono. 1,200 baud ASCII vdu, 64 × 48 four-page scrolling, RS232 i/o in cabinet, quality keyboard video output, £70. G3WRT NOT QTHR. Tel 0206 862286 ext 2263, work.

Heathkit test equipment, audio frequency analyser IM22, combines functions of ac valve/voltmeter, wattmeter, and im analyser, manual, a gift to clear, £15. Heathkit distortion meter LM12, another gift, £10. G5CS, QTHR. Tel 01-398 1582.

PET 8K (scientific small keyboard model) integral tape, Commodore tool kit chip, manuals, PET books, morse tutor program with sound, contest program with hard copy printout, Commodore 3002 printer (cost £425 new) both, £600, or consider 2m and or 70cm fixed station gear to same value. G6EPI. Tel Rochdale 57838, evenings.

Emoto 1100MXX rotator, unused, £125 ono. Cowl gill motor, 14:1 g/box, £25 ono. Heath IM16, £15 ono. Sony TC765 rr tape recorder, £295 ono. Trio gdo, £40 ono. Mains regulator, 250V, 10A, £20 ono. Tel Wellingborough (0933) 663517.

Two capacitors, 40μF, 2·5kV, exc cond, £5 each. Transformer, 1,500V sec 1A, £10. Capacitor 16μF, 7·5kV, £8. Mains voltage regulator, variable 0-260V, 2·5A, £15. Buyer pays carriage. G4LFG. Tel South Shields 566658.

Azden PCS3000, cw two mounting brackets, cable for remote head use, £150 ono. G8YDH, QTHR. Tel 0823 42391, evenings.

Datsun 1976(R) F11 120A hatchback, MoT and taxed, exchange for good amateur gear. G4LQN, QTHR. Tel High Wycombe (0494) 39017.

Sommerkamp FT767DX (Yaesu FT707 Wayfarer series), FP767 psu, FC767 atu, YM3S scanning mic, immac cond, boxed, any trial, list price £790, accept £575. G4LFG. Tel South Shields 566658.

4m 40W linear amp, Microwave Modules preamp, as new, £57. G3XXN, QTHR. Tel 0909 730128.

Kokusai mech filter MF455, 10ck 2·3kHz at 6dB, comp with data, xtal, £11. G3TRB, QTHR. Tel Droitwich 775206.

Four 813 valves, 4·6K dc psu, at 1A, tuning capacitor TRS80, level 2, 16K, full morse facility, other software, valves, etc, £100. Computer, £260. Transformers 4·6K at 1A, £35 each. Tel 0296 82272.

Icom IC211E, good cond, £370. ICRM3, £30 or £390 together plus carr. KW107 atu, few months old, offers. P. Barker, G4HPS, QTHR. Tel Sunderland 226883.

Yaesu FTV901R transverter, 2m installed, mint cond, two months old, orig packing, £220 ono, or part exchange 2m ssb rig, or multimode. Tel Weymouth 786930.

IC30A 70cm fm 10W mobile 22ch, eight fitted, £150. 70cm Modular Electronics transverter, 10W output, £85. Comp WW teletext decoder, £30. 'C' mount tv lens, 8·5mm, F1.5 Cosmicar, £30. Avo valve tester, £25. ST6 rtty tu, £95. G8AYN, QTHR. Tel 047485 2577.

FRG7700, nine months old, vgc, orig packing, manual, £275 ono. Tel Nigel, 061-428 2246, after 6pm.

Eddystone 680X rx, Codar PR30 preselector, the two, £70. Tel 0564 824933.

Atlas 210X incl handbook, £240. Atlas digital dial unit and dfm, £25. AC psu console, £15. G4AKD NOT QTHR. Tel Madingley 211189.

Standard C146A handheld, 2m tx/rx, comp with leather carrying case, helical whip, nicads, base charger, £70 ono. 40W linear 70cm amplifier, unused, £30 ono. Prefer buyer collects. G4FAZ NOT QTHR. Tel Yeovil (0935) 29003, after 6pm.

HF antennas: three-el 10-15-20m trap tribander VS33, rated 2kW, £50; Two-el 10-15-20m cubical quad, 9ft boom glass fibre spreaders, £50. G5ABW, QTHR. Tel 07677 371.

Philips multimeter, ac/dc, ohms etc, 50K per volt, case, £10. Telefunken reel-to-reel tape recorder, immac, £25. Television, 5in tube, batt operated, brand new, unwanted gift, suitable car, boat, etc, £65. All carriage extra. G3OML. Tel 01-540 2713.

Eddystone EC10 five-band rx, fitted fm facility, coaxial input, comp with mains and battery psus, only £60. Sundry vhf transmitter chassis with spare valves. G5UM, QTHR. Tel Leicester 416473.

MMT432/28S transverter, latest model, just back from MM after check/service, £95. Europa B 2m transverter, built into Yaesu case, matches FT101, £50. Yaesu FT221R 2m multimode, £270. *Wanted:* 70cm/4m modules for Yaesu FTV901R. G4MID. Tel Ted, Mildenhall (0638) 715178, working hours.

Icom IC701 hf tx/rx, psu, remote controller ICRM3, mic, as new, £500. Trio TS520SE hf 160-10, Shure mic, matching AT200 atu/pwr meter, as new, £440. Both of these rigs are in excellent cond. MMT70/28 transverter, vgc, £65. Heathkit HW8 QRP cw, built by Heath, hours of fun, £49. Could deliver SW England or buyer pays carriage. G4KUQ, QTHR. Tel Mark, 0272 716093, after 6pm.

HW101, £150 ono. FLDX2000 linear, £160 ono. G4EIA, QTHR. Tel Bristol 673723.

TR2300, nicads, rev rep, as new, £135. JR599/TX599 hf separates, switched filters, fm, rx, £160. Tx, £160. Pair, £300. IC22S, 2m fm synthesized mobile, £130. TF1152 rf power meter, £35. 70cm pa, contact cooled, 4CX250s, £35. G8IWX, QTHR. Tel 047485 2577.

KW Atlanta, £185. FT221R, no mods, £300. Lassen freq counter, £45. KW109, £65. Elka 70 electronic organ, two manual with mini pop rhythm box, £200. G8EWO, QTHR.

Microwave Modules 144/28/LO conv, mint, £15. Datong FL1, mint, £35. VFO5D, exc cond, £25. BC221, inbuilt psu, £20. Drop leaf desk, holds tx/rx, vfo keyer, suitable for shack, £5. Prefer buyer inspects. G3FIU, QTHR. Tel 021-355 5487.

Telequipment DM53A db oscilloscope, £80. Pye transmitter, 70cm base station (xtal RB6), £10. Converter hb, 70cm, 144MHz i.f., £5. G3OXV, QTHR. Tel Daventry 2265.

KW E-Zee Match, KW103 swr pwr meter, KW low pass filter, offers for the lot. G2DRT, QTHR. Tel Penn (049481) 4240, after 6pm.

G-whip multimobile, Extendarod, coils 40/80, std and hd bases, £40. Datong morse tutor, £35. G3ZYN, QTHR.

8A psu, £15 ono. Collection of mobile antennas, £2 each. R. G. Bowler, BRS49705, 2 Westgate Street, Taunton, Somerset. Tel 0823 82832.

Heathkit SB620 spectrum analyser, pan adaptor, suits any i.f., 455kHz to 6MHz, absolutely mint, manual, orig packing, best offer around £60. G3FLD, QTHR. Tel 0952 3758.

G2DAF type rx, completely self-contained, six amateur bands, ssb-cw-a.m., mechanical filter, Q-multiplier, 898 dial, 10kHz per knob revolution, 100kHz xtal calibrator, many spare valves, full circuit information, £65. G3JSB, QTHR. Tel Harrogate 872361.

Three Friden ASCII printers, comp with punch, reader, technical manuals, transporter, £50 ono. Two Creed 7 teleprinters, manuals, £12 each. Buyer collects. NEC CQ110E ssb tx/rx, never used, still G8, £400 ono. G8PLC, QTHR.

Electroniques amateur bands coilpack, i.f. strip, built into rx, £15. Codar AT5 tx mobile psu, control box, £12. Homebuilt top band/80m tx, cw/a.m., mains psu, £18. G4AUB. Tel Rugby 811106, after 6pm.

Heathkit SB104A 100W solidstate broadband hf ssb/cw tx/rx, digital display, instant QSY, Heath built, all plug-in boards, immac cond, incl matching psu/spkr, manuals, £375. Buyer collects or Securicor at cost. G4GTU, QTHR. Tel Rustington (W Sussex) 4123.

FT2F 12ch, R5-8, S20-22 etc, £65. Exchange Bird Thruline insert, 75-150MHz, −40dB output to analyser, deviation meter etc for other inserts. *Wanted:* dual timebase plug-in for Fairchild 766HF 'scope, eg type 74-13A, 74-17A etc. G4AHT, QTHR.

Liner 2, as new, rx preamp, clean tx, £75. Pye Westminster, a.m., midband d'mnt, £20. GEC Kenilworth, a.m., will convert to 4m, £25. The lot, £100. G3TXA, QTHR. Tel 01-882 5292.

2m linear LA106, self-contained unit, £90. TR2200G, 11 channels, £85. 10W pa, with preamp, £12. 5/8 and mag mount, £7. PA1 2m preamp, £3. Enlarger lens, 50mm, 75mm, £5 each. G8EGF, QTHR. Tel Edenbridge 862014.

Trio TR7010 2m ssb mobile, fitted low noise preamp, orig box, mobile bracket, £110. TX/rx xtals, suit W15FM, R0, R3-7, S19-22, £30. GW8XMM, QTHR. Tel Cardiff 810999, office hours only.

FT207R 2m handheld, orig packaging, vgc, 12V charger, helical, spkr mic, £145, no offers. *Wanted:* Manual for Lafayette HA63 rx, loan or purchase. G6CXL. Tel Sheffield (0742) 443797.

Variable capacitors, 500pF/300pF, ganged and geared, £2. 180pF/220pF ganged, £1.25. Similar Jackson 00, 50pF, similar Jackson C804, £1, incl p&p. Graham Southwell, RS49038, 49 Hartington Street, Bedford.

RCA AR88 hf rx, 160-10m, full coverage, exc cond, £75 ono. *Wanted:* Friend for morse practice. Waiting result of RAE. Tel Kettering 83060, evenings.

FT101E, exc cond, new valves, 10MHz cw filter, £350. G4DFX, QTHR. Tel 01-560 7450.

Shugart twin SA801s, d density, 8in floppies, as new, manual, £530. PSU for above and for cpu, £100. Parallel keyboard, ASCII, £40 ono. IBM Selectric, suitable for hi-quality computer 1/0, £230 ono. Solartron scope, dual beam, 10MHz, £50. 1W vhf h/h and diags, £30. G8HUB, QTHR.

Hammarlund SP600, £100. Avo CT38 v/voltmeter, £20. Wayne Kerr CT500 pulse generator, £10. Oscilloscope monitor 4436, £25. R1475 rx, valve tester, USA AR88 case, 50 new octals, offers. Prefer view and collect. *Wanted:* EF97, EF98, ECH83. G3DVF, QTHR. Tel Alnwick 602487.

IC251E 2m multimode, mint, Icom desk and mobile mics, orig packing, bits, £375. TR8400 uhf tx/rx, £250. Both rigs eight months old, would consider part exchange with adjustment for TS830, TS530. G3WPX, QTHR. Tel Winslow (Bucks) 4183.

Trio TR9000, 15 months old, used little, £295. Jaybeam 4-el quad, loft use only, £17. Arrow psu for above, £15, or exchange for good modern rx. G4LFT. Tel 02774 52581.

FT401B, exc cond, mic, spkr, YC601 dig readout, spare valves, manual, £275. GW4IUY. Tel Aberdovey 367.

HW8 QRP tx/rx, ac psu, headphones, £90. FT7, as new, £240. 18AVT/WB Hygain vertical antenna, £40. G3OIC, QTHR nr Birmingham. Tel 0564 826124.

Trio 2300, case, nicads, rubber duck, 5/8 whip, swr meter, mains psu, £125. KW Vanguard, 50W a.m./cw tx, £20. BC221 freq meter, £10. 4-el quad, 144MHz, £10. G4JRH, QTHR. Tel Bursledon (Hants) 2735.

TR9000 2m multimode, used little, in exc cond, orig carton, mobile mount incl, £285. Tel 0840 770344, evenings.

Yaesu FT780R 70cm multimode base or mobile station, 1·6MHz repeater shift, boxed, mint cond, £350 ono. G8WYJ, QTHR. Tel 01-223 9102, after 6.30pm.

TR2400, TR2300, in orig boxes, charger, nicads, etc, TR2400 has SC3 carrying case, £145. TR2300 has RA1 helical ant, mobile mounting bracket, £130. G4KUC, QTHR. Tel John, 061-427 5931.

Yaesu FTDX400, input 560W, £160. G3VGO, QTHR.

AR88LF rx, reliable, spare valves, handbook, £45 ono. KW Vespa tx, 90W, ssb/cw/a.m., 160-10m, incl psu, mic, handbook, £45 ono. Storno 2m base station, 12W, single-channel, xtals for S20-21, R5, £25 ono. G4FEA, QTHR. Tel Farnborough (0252) 549481.

Swan 350 hf tx/rx, 350 p.e.p., 80-10m, ac psu, handbook, good cond, £150. Could possibly deliver. G3ZDG, QTHR. Tel Sheffield (0742) 302210.

Bendix BC433, df rx, £15. BC906 vhf w/meter, £10. Hazeltine OAP1 wavemeter, osc, mint, handbook, £30. Command set Dynamotor, 12/600V, £5. PCR vibrator power supply, 12V, £5. Carriage at cost, or buyer collects. GW8TSP, QTHR. Tel Neath (0639) 820356.

FT301 with FV301, homebrew psu, Shure 444 mic, good cond, ideal first hf rig, £300, or will consider part-exchange 2m multimode. G4MIB. Tel Stuart Senior, 01-675 0280.

TS520S, the best of the 520 series, transverter terminals etc, immaculate model, less than 4h pa use since new, £390. TR7010, vgc, £130. Both cw orig packing, manuals. MMT432/28, £65. All ono. G4IKZ, QTHR. Tel Doncaster 852850, before 10pm.

Yaesu FT480R, FP80A psu, rotator, Tonna 9XY beam, swr meter, Drake wavemeter, rig never used /M, £390. R250 rotator, new, boxed, £30. Tonna 13-el portable 2m beam, 8m portable mast, £40. Tel G6CHB, QTHR. Tel 0632 462606.

TH3 Junior 3-el beam, comp for spares or renovation, £25. Buyer collects. G3HQH, QTHR. Tel 0663 44087.

Yaesu FT101Z, cw mic, fan, additional 600Hz N filter fitted, operational (tx and rx) on all three new bands, £495. CSC, max 50 freq counter to 50MHz, £45. G6VS. Tel George, Blackpool (0253) 823541.

Petrol generator, 230V, 1·5kW, needs attention, £50. Datong D75 speech processor, few hours use only, £40. G3FXB, QTHR. Tel 040-376 342.

FT221RD, YC221 display, bargain, £280. TR3200 8ch, as new, £120 ono. Yaesu FT2 auto 2m 8ch tx/rx, £75 ono. Marconi Kestrel rx, £25. Sota SCL144PS linear, £140. 70cm 500mW fm tx, £5. Pocketphone P5002, nicad, £50. G8NQP, QTHR.

FT101ZD, fan, manual, exc cond, boxed, £395. Spare valves, Fox-Tango model 2108 8-pole xtal filter for FT901, FT902, FT101ZD, FT107, FT707, bandwidth 1·8kHz, fb for dx, £16. Tel 04536 3994, after 6pm.

Collectors: rare WS36 tx, psu, handbook, emers, £50. 100W yacht tx, 14 channels xtalled, handbook, psu, £35. Marconi Marine Seaspan cw tx, mains psu, handbook, £50. LG300 tx, matching psu, £40. Mains psu, suit LG300, £15. G3JFC, QTHR. Tel Crayford 522489.

Yaesu FRG7000 gen cov rx, mint, orig packing, manual, atu, £230. Koyo 11-band sw/vhf rx, £70. Dulci vhf tuner, £10. All ono. Deceased swl gear. *Wanted:* Buy/borrow manual/info, Roband RO50 Mk2 scope. G4BMK, QTHR. Tel 0323 893378.

70cm fm Wood & Douglas scanning tx/rx, 6ch, kit value £100, built, cased, xtalled, wkg to specification on RB0, RB10, SU8, nearest offer to £65. G. Parker, G4EMK, QTHR. Tel Bourne (Lincs) 5224, evenings and weekends.

Swan Astro 102BX, all solidstate, broadband, digital readout tx/rx, dual vfos, 235W input, superb audio, outstanding rx, matching psu/spkr, service manual, near new, perfect, £425. G2KF, QTHR. Tel 072-681 2337.

FRG7700 gen cov rx, FRV7700 type A converter, both mint, four months old, £300. Tel Norwich 37210, evenings.

Antique Marconi type 2 valve, sw/lw, No 62449, orig oak cabinet, 13 by 8 by 9in, Amplion AR19 oak petal horn spkr, serial No A128109, both in wkg order, offers, cash or w.h.y? Tel 0602 871910.

Hi-fi equipment: two Hafler DH101 preamplifiers, one used but in exc cond, £135, the other new and unused, £185. Both boxed with instructions; Pickering XSV4000 and XV15140E cartridges with spare styli, as new, offers; Ambit 7230 (Hyperfi) fm i.f. module, with data, £10. Will consider px for Yaesu 70cm equipment. Tel Tony, Southend 351936.

Trio TS120V, immac cond, used little, MC30S mic, £280 ono. TL120 amplifier, still under warranty, £110 ono. G4KLI, QTHR. Tel Macclesfield (0625) 29748.

Telequipment S32A oscilloscope, 10MHz, 10mS, £45. TR44 rotator, £40. Redifon marine base station, GR286, fm, 12ch, 12W rf output, no cables/xtals, £10. Two 21ft alloy scaffold poles, clamps etc, £10. G2BUW, QTHR. Tel Romford 43122.

Advanced electronic applications Morsematic electronic keyer, memory, incl mode for sending random morse for training, has beacon mode, auto serial number for contests, price incl "Ultimate" iambic paddle unit, £75.50. G4ANH, QTHR. Tel Rickmansworth 79935.

Quad FM3 tuner, 33 preamp in wooden sleeve, 303 power amp, 45wpc, superb introduction to quality hi fi, £275. G6CLZ. Tel Stan, Wolverhampton (0902) 764214.

C8800 standard 2m fm mobile, 10W scan, five memory channels, good wkg cond, looks poor, hence price, £150. Tel G3WWT, QTHR. Tel 01-898 2417.

FRG7, year old, £140. MMC144/28 converter, £15. PF1 Pocketphones for 70cm conversion, £20 pair. 3ch PF2s with battery, mic, ant, £35. Battery charger for PF2, £7. Buyer collects. G6FCP. Tel Grimsby (0472) 813450.

FT301, FP301 psu, 250H cw filter, mic, £375. Exc cond, 14MHz 2-el beam, £20. Prefer buyer inspect collect. G2MA, 24 Moorlands, Wickersley, Rotherham. Tel 0709 542708.

GEC RC411 professional communications rx, covers 10kHz-31MHz, handbook, circuit diagrams, £375. Tel Hastings 751114.

Yaesu FT707, FP707, FC707, all as new, boxed, £650. Yaesu FT902DM, new, boxed, £695. Freq counter, YC355D, 200MHz, £55. FT480R, as new, £300. Taylor, 5 Luther Road, Winton, Bournemouth. Tel 510400.

Joystick antenna, Joymatch atu, Hurricane brace, support insulators, operating instructions, £15. G2DHI, QTHR London. Tel 01-727 1767.

TR2400, charger, helical, nicads, £140. ZX81 computer, psu, leads, manuals, £55. All in exc cond, less than six months old. G3XRM, QTHR. Tel 0724-845436.

2m handheld, FDK Multi Palmsizer, external mic/spkr, £95. Adonis compressor mic model AM802, three switched outputs level meter, £37. G3ZJU, QTHR. Tel 01-527 4492.

Creed teleprinter model 7B, reperforator, Creed tape reader, both in good wkg order, £40. Buyer collects. G8ZLR, QTHR. Tel Keighley 61457.

Oskerblock SWR200 power/swr meter, 3·5-150MHz, 2W, calibration charts, as new, list £49, £22. SEM Ezitune ant tuning aid/noise bridge, SO239 sockets, £19.50. G3UJX, QTHR. Tel 051-677 1518.

Hygain TH3JR, balun, £75. Mosley Elan 3-el 10/15m, £65. Western Alumast, two off 10ft sections, hinged base, rotor plate, top plate, capable supporting beam at 30ft, £70. G3SJH NOT QTHR. Tel 021-427 1115.

Redifon GR286 144MHz tx/rx, slight attention needed, seven tx channels, £35. 30m UR67 coaxial, £13. 12/24V 5A protected psu, £20. G4BWE cw memory, boxed, exc construction as Sept '79 *Rad Com*, £18. 2m xtals, enquire. G4LMJ, QTHR. Tel 051-336 4359.

Mosley A203C 20m 3-el monobander, £60. Buyer collects. Stereocoder, £15. Tech Assoc PN2 filter, £20. MMC 14H/28LO, £15. G5RP, QTHR. Tel East Hendred 384, after 14 June.

Power Mite PM3A, 5W input, freq 7 and 14MHz, £25. Buyer collects. Jack Martin, 10 Oxton Drive, Tadcaster, Yorks. Tel 832061.

Trio TR7600 2m fm, RM76 remote control keypad, £200. TR2400, soft case, spkr/mic, charger, £160. Multi U11 70cm fm, RB0-11, RB14, SU8, SU20, £100. G8MCV NOT QTHR. Tel 0462 53414, day, 0438 64624, other.

Yaesu FRG7000 0·5/30MHz rx, digital display, exc, no modifications, £200. Daiwa SR9 2m rx, £35. Ohio Superboard 8k computer, interfaced to tv, vdu, Creed teleprinter, many programs incl morse tutor, £190. Tel Chelmsford 400825.

4-1,000A linear amp, 80-10m, full legal limit, £350, or trade for FT221R/FT7/Argonaut 509. G5CSW NOT QTHR. Tel Newmarket 67055.

Hygain 18AVT/WB in good wkg order, £25, plus carriage or collect. Correct 12swg aluminium wire for repair of Hygain traps, 10p/ft plus postage. G6ZH, QTHR. Tel Cholsey (0491) 651259.

TS120V, in orig packing, manual, vgc, £310. TenTec PM3A 20/40m 5W cw tx/rx, mint, orig box, manual, £45. TenTec PM2 15-80m tx/rx, 2W vfo/xtal, full break-in, manual, £20. G3XPM, QTHR. Tel 0423 871723, eves/weekends.

Eddystone EC10 gen cov rx, £70. Uria gen cov rx, £20. Pye Ranger tx, wkg on 2m, spares, £10. SSM 2m conv, 4-6MHz i.f., £15. Buyers collect. G6ANP, QTHR Avon. Tel 027583-2768, weekends.

Enterprise sailing dinghy with trailer, approx value £300. Will consider swapping for hf tx/rx, dfm, atu, swr, rtty equipment, etc, or w.h.y? Tel Leighton Buzzard (0525) 376851, after 6pm.

Yaesu FRG7700 and mems, as new, £275. Standard C78 with amplifier, mobile mount, case, nicads, as new, £225. Tel Mike, Beaconsfield 6094.
Eddystone 770U uhf rx, 150-500MHz, vgc, £120 or exchange for small 2m handheld tx/rx. RS47491. Tel Windsor 63577.
FT480R 2m multimode, £290. G8XBH, QTHR. Tel 01-689 2928 (Croydon).
Yaesu 101ZD fm, FC902, brand new, £750. Tel Derby 557705.
JIL1980 SX200 programmable scanning monitor rx, psu, vgc, vhf band, 26-57·995MHz, 58-88MHz, 108-180MHz, uhf band, 380-514MHz, orig packing, receipt, cost £240, bargain, £135. BRS31382. Tel Charles, Portsmouth (0705) 697075, after 7pm Mondays, Wednesdays or Fridays.
KDK 2025E, 25W, 144-148MHz mobile tx/rx, good cond, 14 months old, fitted with receive preamp, £150. Selling due to owner going multimode. G8ZIS. Tel Bristol 666387, after 7.30pm.
FT207R, comp, YM24 spkr/mic, NC2 charger, extra battery NBP9, λ/4 whip, lot, £150 ono. G3OUX, QTHR. Tel 0293 34139.
TS180S, mint cond, new bands, cw filter, in orig packing, manual, superb rig, no time to use, £530. Green & Davis 6N2 2m a.m./cw tx, 3-10 pa, ac/dc supplies, £15. G3XPM, QTHR. Tel 0423 871723, eves/weekends
Heathkit HW8 QRP, HWA71 psu, swr/power meter, all perfect cond, £130 ono. HF5 trap vertical, £30. G4GIJ, QTHR. Tel 01-660 5474.
Atlas 210X 80-10m ps console, manual, 200W, p.e.p. input, exc rx, £275. Matched pair MRF450 output transistors, MRF8004 driver, new, £25. *Wanted:* Software/hardware for Sharp MZ80K rtty/cw and other amateur radio applications. G4DGY, QTHR. Tel 042-156 6048.
Small quantity of waveguide, rotary vane attenuator, both suitable for 3cm, approx 100ft low loss coaxial, uhf sig gen (Pye SG1), two 20V psus, offers. Liquid xtal dmm, six months old, perfect cond, £40. Base station mic, £15. G4NEC, G8TMG, QTHR.
Trio 500SE rx, amateur bands, £65. Pye Bantam, incomplete, £15. Racal dfm, £50. Eddystone EB35, £40. Marine vhf tx/rx, £85. SAE list. Moving QTH. *Wanted:* R1155, T1154, cables, plugs, loop, indicator, etc, to make comp station. G3DVF, QTHR. Tel Alnwick 602487.
Western DX5V 80-10m 26ft vertical, instruction manual, £45, or exchange for HF5 and HF5R. GM4EWM, Gormond, Walker's Crescent, Lhanbryde, Moray. Tel 2530.
Drake SW4A, MS4 spkr, £60. Icom 255E, £160. Trio 9R59D, SP5D, £40. Trio TS510/PS510, 110V, cw filter, rx needs attention, £80. Heathkit monitorscope HO10, £25. FP101, £7. FV101, £35. Europa trans spare QQ406/40A, £50. PM2000, £35. Datong clipper, £30. FL1 filter, £30. Frequency counter 2K-200M, £35. TMK500, £15. KW lp filter, £10, 2m conv 28/30, £10. MM preamp, £10. RF field meter, £6. Codar, PR30, £15. E-Zee Match, £25. 18AVT, £25. DX5V, £15. Ringo Ranger, £10. VHF 4/4, £10. 2-14ft alloy poles, £8 each. Rigonda 6in portable tv, £10. Shure 444, £12. Eagle gen cov rx, £10. Micro Professor, microtutor, new, £45. exch any above for printer, W.H.Y? TRS80. G4BWX, QTHR. Tel 0524 414013.
Racal RA117 rx in exc cond, comp with Racal desk cabinet, handbook, £195. Little used Ferrograph tape recorder, £35. Buyer to inspect/collect. Morris. Tel Bolton 52384.
Canon 318M super 8mm auto zoom camera, Cinerex 727 dual gauge projector, hardly used, £90. Futaba four channel three Servo r/control nicad, charger, £75. Collect or pay carriage. G4LZD, QTHR. Tel 08043 2206, evenings, 08043 3775, work, Monday to Friday.
G3PLX, vdu, rtty unit, psu terminal unit, keyboard, uhf modulator, £120. PF1 pocketfone xtals for RB0, toneburst, nicads, £25. Roberts, G8FDJ. Tel Sheffield 333847.
KW202, KW204, £200. Will separate. G6KI, QTHR. Tel 021-458 3892.
4m converter, 28MHz i.f., £15. Morse—send or receive on PET computer, separate programs, cw interface info, £5 each. *Wanted:* FV901DM, a.m. filter. Creed 75 two-speed gearbox, Thruline elements 250H, 250C, 25C, Fax receiving equipment. G3AZI, QTHR. Tel Preston 37815.
Standard C8800 2m fm five mem computer controlled, as new, £170. Trio 2200GX, R1-7, S19-23, fully xtalled, nicads, case, helical, mobile mount, etc, £85. G6DFM. Tel 01-397 0589.
Liner 2 2m ssb, manual, mounting bracket, preamp, £80. Six-el quad, £15. Buyer to collect or £90 the pair. G4MEO, QTHR. Tel Sandy 80043.
Professional comms rx, Eddystone 880/4, 30 bands, 0·5-30·5MHz, £250. Power oscillator, 200-2,500MHz, 110V, 10W op, £20. Sig gens CT478, 1·3-4·2GHz, CT480, 7-12GHz, handbooks, £30 each. Pye Bantam, S20, £30. Teleprinter 7ERP, immac, auto 6A, TDMS 5ABV, £50. RG188A/U, min ptfe coaxial 15p/m, block of four bases, 4X150A type, believed OK for 2m, £20. Bird coaxial switches, the ultimate, 1-pole 6-way, two off, £35 each. 2-pole 2-way, £30. *Wanted:* mains transformer, Solartron CD1400 scope. Prefer cash and carry. G8ANZ, QTHR. Tel 045-382 4123.
Heathkit HW7 cw tx/rx, mods by Heath, Jan '81, £50 ono. STE AK20 2m tx/rx, xtals S12, S20-23, R5-7, R0, £60 ono. GI4JTF, QTHR. Tel 02317 6575.
TR2400, ST1 base charger, hard leather case, nicads, helical, all as new, £180. FT200/FP200, all 10m, 201 mic, £170. *Wanted:* Fax rx with drum speeds of 60, 90, and 120rpm and ioc of 288 and 576. G4EUL. Tel 0359 70434.
FT221R, D suffix, used little, orig packing etc, piptone generator, preamp fitted but otherwise un-butchered, handbook, mod records available, £290. Buyer inspects and collects. G4HDK, QTHR. Tel 0753 48406.
FT505 hf tx/rx, as Yaesu FT401, Shure 201 mic, £210. Buyer collects or carriage at cost. GM4GUX, QTHR. Tel 031-332 5300, evenings.
KW2000, vgc, comp history known since new, some spare new valves, Shure mic, £145. G4HHA, QTHR. Tel Ipswich (0473) 79935.
Trio 9R59DS communications rx, stabilizer valve fitted, good wkg order, £45 ono. E. Rother, 1 Welbeck Street, Abbey Hey, Manchester M18 8GW. Tel 061-231 3025.
Retiring to 70MHz cw, almost all equipment must go, wide range of gear incl pneumatic mast, compressor, TH3 tribander, scope, linear, desk mic, atu, lots more. SAE for full list with prices. G4HWD, QTHR. Tel Bath 22617.
Heathkit HW12A, 80m singleband ssb tx/rx, 200 p.e.p. input, comp with psu, spkr, mic, leads, handbook, £50, or exchange for 2m transverter. Buyers collect. G4KKG, QTHR. Tel Yeovil (0935) 25327.
Nascom 3A psu, £15. TR7500, £138. Yaesu YC355D, 200MHz counter, 0·001 per cent timebase, £80. ZX80 3k ram, £20. Clare Pendar KB6 ASCII keyboard, fully coded, £30. MM 500MHz 10:1 prescaler, £15. Sentinel auto hf preamp, £12. 144MHz linear pa, 3W in, 25W out, £25. G3PLX type rtty terminal incl keyboard, psu, part-built in Verocase, £50. RTTY test message genr, programmable callsign, £24. Wood & Douglas modules 70FM05T4 tx, £15. 70FM05R5 rx, £30. 70MC06T 6ch tx adaptor, £6. 70MC06R 6ch rx adaptor, £10. MD05T less xtal, £18. 144MHz 10W fm pa pcb, £8. Sony electret condenser mic ECM250 low impedance, £5. Postage extra. *Wanted:* IC402 or MMT432/28S. G4CGS. 81 Quintilis, Bracknell RG12 4QQ. Tel Bracknell 55898.
FT290R cw psu, charger, nicads (sub c), flexi-whip, carry case, base stand, other bits, mint cond, £225 ono. MM144 25W linear amp, preamp, 32W at 13·8V, £50 ono. Going USA—must sell! A. Cox, 1 St Barnabas Terrace, Plymouth, Devon.
KW2000A, ac psu, handbook, £135. PKW 10-80m trap dipole, £12. VHF pa assembly, 4CX250B, base, blower, tank circuit, offers. G3TXQ, QTHR.
Acorn Atom (12 + 12k), £250. RTTY program, auto figs/letts shift 10-150 baud (for Atom), hardware details, £12. Creed 54, perforator, reader, £30. Carriage extra. Technics RS1500, two-track, reel-to-reel, £250. Tel Melton Mowbray 822152, after 5pm.
Cossor 1035 Mk3 dual trace cro, good cond, 7MHz bw, £35 ono. Solartron dual trace cro, 10MHz bw, £40 ono. Japanese wartime rx, collectors item, offers. G6BZK. Tel 0323 29296.
144MHz linear, 10in, 80W out, preamp, lunar, £75. PA3 preamp, £3. 13·8V psu, 5A, £10. FT221R mobile mount, £10. MM4000, keyboard, two months old, £240. SWR bridge, 144/432MHz, vgc, £15. G8ESK, QTHR. Tel 0274 45611.
88mH toroids, American open type, suitable BARTG tu, ST5, ST6, DT600 etc, £2 each, plus 25p post and packing. Chris Pedder, G3VBL, Thorncliffe, 5 Royalty Lane, New Longton, Preston, Lancs PR4 4JD. Tel Preston (0772) 612289.
SRX30, £100. MMC144/2·4, £20. Heathkit HFW1 alignment generator, £40. Murphy M3 sig gen, £20. G4CLF 10·7MHz ssb module, £35. Sinclair PDM35 dmm, £20. Leak Varislope valve amp, preamp, £20. Integrex pll stereo decoder, £10. All good cond. Carriage extra. G3RAS, QTHR.
FT101ZD, a.m. Mk2, incl fan, mic, used little, £450 ono. AM10D Pye Cambridge on 2m fm, 6ch, £20 ono. G4DEN, QTHR. Tel Newton-le-Willows 6099.
Trio R1000 rx, mint, £230. Sommerkamp TS802, 2W, 80ch handheld, £100. Rotator, £25. *Wanted:* Jaybeam 6-el 2m quad or large Yagi 70cm linear. Tel Astwood Bank 2282.
FRG7 rx, mint front cover, battery holder, £140 ono. FR50B ham band rx, calib 10MHz, no mods, £70 ono. GM4MTI. Tel 0631 62536 or 0631 62965.
Eddystone 840C rx, first class cond, has just been realigned, ideal for short wave listening, £60. Tel Sheffield 467781.
Trio R1000, gen cov rx, good cond, orig packing, handbook etc, QM70 144MHz converter, £195. AD270 Datong active antenna, mains psu, £32. Buyers pay carriage. Would consider deliver R1000 within 50 miles Bradford. Bancroft, G8PPR, QTHR. Tel 0274 674396.
Trio TR2400, as new, in orig packing, comp with charger, nicads, helical, manual, etc, £160. G4EHZ, 16 Sussex Road, Worthing, Sussex. Tel 39612 after 6pm.
Eddystone 820 tuner, exc cond, £18.50 plus carriage, or collect. New boxed valves for Marconi and Hammarlund rxs, considerable collection, quality mains trans etc, 10 amateur band xtals, four for £1, plus postage. G8GI, QTHR. Tel Stamford (0780) 4204, evenings.
18AVT/WB trap vertical, 10-28m, 15m, UR67. Buyer collects. Coward, 41 Bakers Lane, Southport, Merseyside. Tel 0704 27279, after 7pm.
Trio R1000, as new, orig packing, leads, manual, etc, £225 ono, or exchange KW2000B/E, TS120/130S, cash adjustment. Anthony Richards, Castell Forwyn, Abermule, Montgomery, Powys SY15 6JH. Tel 0686-86 255.
Clearing shack of all spare gear, send an sae for list of large and small items. First come first served basis. Buyer collect or pay carriage/postage. Ron, G3AAJ, AMSAT-UK, 94 Herongate Road, Wanstead Park, London E12 5EQ.
FT7, £235. IC202E, £130. Liner 2, £75. Two Marconi Mk5 picture and waveform monitors, need attention, £10 each. Tel Chelmsford (0245) 66776.
Trio 9R59DS rx, manual, calibrator, stabilizer, spkr, £40 ono. FL200B tx, manual, £80 ono. C4 vert dipole, £25 ono. Buyer collects. G4JBF, QTHR. Tel Hull (0482) 843011.
Decca KW107 atu Z-match, swr meter, antenna switch, power meter (1,000W), £70 ono. 18AVT vertical 10-80m, £60 ono. Microwave 100W 2m linear MML144/100, £60 ono. Heathkit SB280 10-80m 1,000W linear, £180 ono. G4JKM, QTHR. Tel 0452 411409, after 6pm.
Trio Kenwood TS530S hf tx/rx, nine bands, 160-10m, four months old, in perfect cond, this is the actual equipment reviewed by myself in June/July 1981 *Practical Wireless*, £495. Tel G3KLF, tel Fareham 236906, weekends or evenings only please.
KDK fm 144-10 SXR2, 10W mobile rig, hi/lo power, 5kHz steps, digital readout, repeater, auto toneburst, mic, power lead, packing etc, swr meter, exc cond, £115 ono. *Wanted:* TR2300. G4LEX. Tel Gloucester 421013.
VDU rtty station, Catronics CD300 rtty to vdu converter, uhf modulator, ST5 terminal unit, keyboard, built-in 24h digital clock, £200. Heathkit SB301 rx, 10-80m, handbook, headphones, £80. Heathkit HW202 2m fm tx/rx, 6ch, toneburst, handbook, mobile mount, mic, £80. G3PLX Amtor converter, already built, power supply, leads, instructions, £80. G4KHX, QTHR. Tel 0908 76820, evenings and weekends.
Helical coaxial, 0·43dB/100ft/144MHz, 0·82dB at 70cm, Hackethal CU2Y50, 30m and 40m at £2 metre plus carriage. Avo 8 multimeter, brand new, £65. 6800D2 development system, manual, lots extra ics, £75 ono. Heavy duty armoured cctv cable, 184m at 60p/metre. I defy anyone to beat my shack clearout component prices—eg metal film resistors, 0·25W, 0·5 per cent at 1·5p. 1 per cent at 1·2p. 2 per cent at 1p. 0·25W carbon at 0·25p. 10,000μF/16V at 25p, 36,000μF/20V at £1. 1,000μF/400V at 50p. 709 (14 pin) at 8p. 0·3in l.e.d. display (TIL312) at 30p. 1N5401 at 3p. 5W/12V zener (1N5349B) at 20p. Special for heavy duty power supplies: 9M71-400 diodes (400V/70A stud mount), to BS9000 spec, £1 each. Plus many, many more bargains. Send large sae, or 25p for list. G8RBY, 43 Thorpe Road, Melton Mowbray, Leics LE13 1SE. Tel 0664 67118.
FRG7 digital, no mods, £150. FRT7700 atu, £20. Both as new, with orig packing. Tel John, 0276 62252, ext 305, working hours, weekdays only.
TR7800 2m fm rig, as new, in orig packing, £210. HF5, with radial kit, £40. GW4JAD. Tel 044-361 3912.

WANTED

B2 and A Mk3 suitcase radio or any other wartime suitcase/spy type radio. Any cond or incomplete welcomed. G8VDZ, QTHR. Tel 01-949 2317.
Circuit diagram/manual for TCS12 tx/rx. Article from G3LOX *SWM* Oct 1958. Payment for borrow or retention, your price. J. R. M. Hewitt, 19 Rectory Way, Kennington Ashford, Kent TN24 9RE. Tel Ashford 21158.
HF linear amp. FL2100Z preferred but anything considered. G3NDC, QTHR. Tel 01-954 1309.
Triband beam, quad preferred, cond unimportant if price is right. Rotator for above, cash waiting. G3NDC, QTHR. Tel 01-954 1309.
Wireless sets 38, 18, 46, 48, Mk123, Mk128, A510 etc, and/or parts/accessories for collector, have early/late model radios for trade or sale. Tony Grogan, WA4MRR, 5 Rollingwood Drive, Taylor's, South Carolina, 29687, USA.

For the National Wireless Museum: old radio magazines, books, catalogues, QSL cards, valves, components, Gamages catalogue, any old knobs! 1916 White valve, Mk3 aircraft tuner, gen on Cossor 1035 scope. Collection arranged. Details please to hon sec G3KPO, QTHR. Tel 0983 62513.

Marconi keys etc. Write Dave Johnson, 6360 Skyline Drive, 137 Houston, Texas 77057, USA. Tel (713) 654 1587.

KW109. *For sale:* TS520SE, in exc cond, £340. Buyer collects. G2UZ, QTHR.

Desperately require circuit for HW8, full QSK mod, must be fully solid-state and dispense with mechanical relay, preferably using pin diodes. Please help! G4GTU, "Lanfine", 57 Golden Avenue, Angmering-on-Sea, Sussex BN16 1QX. Tel Rustington 4123.

HC6U xtals, any frequency between 3·290-3·480MHz, 4·980-5·280MHz, 8·480-8·580MHz, 15·480-15·830MHz, 22·480-22·930MHz. G3WEX, QTHR. Tel 021-354 4265.

Panadapter, war surplus, Heathkit etc, any type considered. All letters answered. Details to GM3JDX, QTHR.

Circuit of KP202 144MHz handheld to copy. G3EJF, QTHR.

Books: *Radio and Television Servicing,* published by Newnes, edited by Hawker. All volumes from 1965 onwards. Details and prices to G8VEH, QTHR. Tel Shoreham-by-Sea 3706.

A510 wireless set/parts, sweetheart radios, Polish/Dutch clandestine radios, British/German radios, second world war, manuals, WS48/18/38 radios, parts. W.H.Y? I have USA military/clandestine. Tony Grogan, 5 Rollingwood Drive, Taylors, SC 29687, USA.

Borrow or buy manual for Codar 70A Mk2, set of coils for Codar Multiband 6. Tel Boston (Lincs) 67408, anytime.

TS520SE or similar tx/rx, in exchange for Cavendish 2000 electronic organ. Further details, sae G3JPJ, QTHR. Tel 01-958 6887, after 6pm Monday to Friday, anytime weekends.

Astro Compass, ex-RAF, exchange Clare Pendar KB5, large tx bottles, WS atu capacitor, binocs or cash. Ring and haggle. G3HJF, QTHR. Tel 05827 67178.

CT436 scope, circuit diagram, purchase or borrow. G3JWI, QTHR. Tel 0277 218531.

Split-stator capacitor, 250pF, high voltage for atu. Parts for G2DAF Mk2 rx. G3KBI, QTHR. Tel Guisborough 76312.

Drake R4C, T4XC, TR7, MN2700, L4B, L7, L7E, or similar equipment, for cash. Jim Taylor, 5 Luther Road, Winton, Bournemouth. Tel 0202 510400.

Always interested to buy German second world war radio equipment for collection. Any cond. Friedrich Biedermann, 20 The Dene, Ealing, London W13 8AY. Tel 01-998 9286, evenings.

Suitcase or similar miniature tx/rxs (British, American or Polish wartime manufacture). Post-war sets welcome; any spares, damaged sets, orig manuals, w.h.y? WS62 (with transistorized psu), army tx No 53 Mk2. Any a.m./phone mo/xtal tx/rxs. Taylor, G3UCT, QTHR. Tel Fleet (02514) 6998.

FT75B parts vfo, vxo, external dc/dc power supplies, bits and pieces. Heavy type morse keys, no matter what cond or state, send your bits and pieces or keys, cash by return. G4IZW, QTHR. Tel Ken, 0632 678828, anytime.

Dig out those old QSL cards. I am keen to purchase any pre-1930 cards and eager to receive any used before 1925. I also collect any Antarctica cards (any country, any year). G3BDQ, Whitefriars, Friar's Hill, Guestling, Hastings, East Sussex.

Morse key, good quality like Marconi 365 or BPO 610, in good cond. Matching spkr SP101B/277B, or SP101PB/277PB for Yaesu FR101. Eight-pin octal type plug for ex vfo socket on the FL101 tx, GW4JKR, QTHR.

Swan 100MX mobile. G-whip, bumper mounted. Cash waiting. G3NXD, QTHR. Tel Kidderminster 850570.

AT120 or AT130 in good cond. G6CHM. Tel Wolverhampton (0902) 893167.

Xtals for 4m 8·8100, 29·8900, 8·8086, 29·8750, 8·7625, 29·7000 or w.h.y? MMT70/144 transverter. *For sale:* TA speech processor, £15. G3UJK, QTHR. Tel 0494 25491.

SP101B, external spkr for FR101 rx, in good cond. Tel Bristol (0272) 601576.

Heathkit dc power supply, No IP28, must be good cond. G8YGU, QTHR. Tel 0642 211685.

Circuit diagram for Eddystone 740 rx. Borrow, photocopy or whatever suitable arrangement. *For sale:* mobile bracket for Trio 2300, £7. GI3YMT, 15 Everton Drive, Cregagh, Belfast 6. Tel 794688.

Mobile rallies calendar

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

13 June—Elvaston Castle Mobile Rally, Elvaston Castle Country Park, 5 miles south-east of Derby on the B5010. Organized by the Nunsfield House ARC. Opens 10am. Talk-in on 144 and 432MHz. All the usual facilities including full on-site catering facilities. Further details from Ian Cage, G4CTZ, QTHR, tel Derby 71875 or 799452. Trade enquiries to Mr R. Woolley, G4HIJ, QTHR, tel Ashbourne 43241.

13 June—RNARS Mobile Rally, HMS Mercury. Open 10am to 5.30pm. All usual trade stands, and arena events. Talk-in on S22, 432MHz, and 3,660kHz after 0830. Raffle and picnic facilities. Details from A. G. Walker, G4DIU, 103 Torrington Road, North End, Portsmouth PO2 0TN.

20 June—Denby Dale & DARS Mobile Rally, Shelley High School, Skelmansthorpe, Nr Huddersfield. Open 11am. Talk-in on S22 and SU8. Details from J. Clegg, G3FQH, QTHR.

27 June—Longleat Mobile Rally. This will be the City of Bristol RSGB group's 25th event. Entertainment by The Bristol Unicorns Youth Band. There will be a mast erection contest, involving teams of four entrants, the winners of which will be awarded the "Longleat Trophy" presented by Lord Christopher Thynne. It is hoped that the President of the RSGB will attend. Arrange to meet your friends under the Union Jack, near the bring & buy stall. Preliminary enquiries for trade stands to, and further information from, B. L. Goddard, G4FRG, tel 0272 848140.

27 June—Rolls Royce ARC Mobile Rally, Rolls Royce Sports & Social Club, Barnoldswick (six miles south of Skipton, 12 miles north of Burnley, access from A59 and A56). Open 11am-6pm. All usual facilities—trade stands, refreshments, talk-in etc. Details and applications for booking forms etc from L. Logan, G4ILG, c/o 19 Fenton Avenue, Barnoldswick, Colne, Lancs BB8 6HB, tel Barnoldswick 812288.

11 July—Worcester & DARC Annual Mobile Rally, the High School, Ombersley Road, Droitwich. Talk-in on vhf and uhf. Attractions will include "strawberry fields", fancy dress competition, model aircraft and static displays by local organizations. Details from rally manager Tony Blissett, G8NSL, 26 Cherry Orchard, Holt Heath, Worcester, tel Worcester 620507.

18 July—Pembroke & DARC "Bucket & Spade Party". The Regency Hall, Saundersfoot. Open 11am. Talk-in on 144 and 432MHz. Details from GW3XJQ, tel 09945 267.

18 July—Cornish Rally, Technical College, Camborne, Cornwall. Details from Andy French, G8TUJ, 12 Pentalk Road, Camborne, tel 0209 717343.

18 July—Sussex Mobile Rally, Brighton Raceground, Racehill, Brighton, Sussex. Open at 1030h. Special event station, GB2SMR, will be operating talk-in on S22 and 432MHz. All the popular attractions, including mini bus rides to the beach. Free on-site car parking for 4,000 cars. Further details available from G. Miles, G3VBE, 65 Montgomery Road, Hove, Sussex, tel Brighton 778546.

25 July—Anglian Mobile Rally, Stanway School, Colchester, Essex. Open 10am-5pm. Talk-in on 144MHz. Further details from G3YAJ, tel 0206-39 3938.

25 July—Scarborough ARS Mobile Rally, The Spa Ocean Room, on the sea front. Open 10.45am. Talk-in on S22 and GB3NY (RB0). Usual attractions including bring-&-buy, plus 50th anniversary events. Help given to RAIBC members by prior arrangement. Further information from G4JAQ, QTHR, tel 0723 862638.

1 August—RSGB National Mobile Rally, Woburn.

8 August—25th Annual Derby Mobile Rally. Lower Bemrose School, off Derby Ring Road, just follow signs. Talk-in on 144MHz fm. Open 11am-5pm. Free spot prizes, free admission, parking. Many new attractions, plus all the old favourites. Details from Mike Darn, 22 Reservoir Road, Brockwell, Chesterfield S40 4HF, tel 0246 202690.

15 August—Preston ARS 14th Annual Mobile Rally, Walton-le-Dale County High School, Brindle Road, Bamber Bridge, Preston (1 mile from M6 junction 29). Open 11am. Talk-in on 144MHz fm S22. Usual attractions including the popular bring & buy stall. Refreshments. Free entry and parking. Details and enquiries from Mrs D. Stevens, 13 Arrowsmith Close, Hoghton, Preston PR5 0DV, tel Hoghton (025485) 3304.

22 August—Bromsgrove & DARC will be holding their picnic this year at Avoncroft Art Centre, Bromsgrove. Talk-in on S22. On site parking. Licensed bar. Refreshments. Attractions for the whole family. Details from J. F. Burford, c/o the Art Centre.

29 August—BARTG Rally, Sandown Racecourse, nr London. Details from sec Edward Batts, G8LWY, 27 Cranmer Court, Richmond Road, Kingston-upon-Thames, Surrey.

29 August—Torbay Mobile Rally. ITT Social Centre, Old Brixham Road, Paignton. Talk-in on S22 from 1000h. Ample free parking. Trade stands and used equipment stall, draws. RSGB book stand. Hot meals and bar facilities. Details from G4DZH or G2CWR. Trade stand footage applications from G4DZH, tel 0803 523063.

12 September—Fifth Telford Mobile Rally, Telford, Shropshire. Extended layout, about 40,000 sq ft. Varied attractions. Full catering and licensed premises on site. Over 60 stands. Free entrance and parking. Further details from G8DIR, tel Shrewsbury 64273; G8UGL, tel Telford 584173; or G3UKV, tel Telford 55416; all QTHR.

12 September—Vange ARS Mobile Rally, Nicholas School, Basildon, Essex. 10am-5pm. Talk-in on S22 with callsign GB4VMR. Many attractions including trade stands, bring & buy, raffle, door prize and refreshments. Details from Albert Smith, G4FMK, QTHR, tel 0268 683805.

19 September—Peterborough R&ES Mobile Rally, the Wirrina Sports Stadium, Bishops Road, Peterborough. Situated on the river embankment with plenty of car parking space. Open 10.30am till 5pm. Details from D. T. Wilson, G4KSW, 4 Conway Avenue, Peterborough, tel Peterborough 76238.

26 September—Harlow Mobile Rally, Harlow Sportcentre, Hammarskjold Way, Harlow, Essex. Bar, restaurant, parking, bring & buy, trade stands. 11am to 5pm. Details from Phil, G8FRG, QTHR.

3 October—Great Lumley ARCS Rally, Community Centre, Great Lumley, Nr Chester-le-Street, Co Durham. Open 11am. Talk-in on S22. Usual attractions including bring & buy. Further information from Max Hanaghan, G8HPW, QTHR, tel 078324 3946.

Special event stations

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

GB2CRJ, 19 June
The station, which will be in the architects department in Coventry, celebrates the 50th anniversary of Coventry ARS. It will operate on both hf and vhf. Details from D. R. Farn, G4HRY, QTHR.

GB4LHS, 19 June
The station forms part of the Lochaber High School Open Day. Details from David Leckie, GM4NFI, 15 Lanark Place, Fort William PH33 6UD.

GB2RB, June/July
The station will celebrate the birth of the Prince and Princess of Wales' baby. It will be operated from the nearest Friday at midnight after the birth, on 3·5 to 28MHz and 144MHz, by the Bushey Wood Activity Group. Special QSL cards will be available via the bureau, and direct QSL cards should enclose sae and ircs. Details and direct QSL cards from Bill Bartlett, G4KIH, QTHR, tel Rayleigh 747851.

GB4STD, 6-7 July
The station will operate at the open days, St Dunstan's, Ian Fraser House, Ovingdean, Nr Brighton, East Sussex. It will operate on all bands using audible aids. Details from Ted John, G3SEJ, QTHR.

G3IGS, 16-18 July
The station, which will be operating during the whole of 1982, but particularly during this weekend, celebrates the 50th anniversary of Illminster Grammar School Old Boys' Association. A special QSL card will be available, and members of the Society who have lost contact are invited to write to G3DTB, QTHR, from whom details of the event may also be obtained.

GB8SGS, 17 July
This station will operate during Steyning Grammar School fete, on 144MHz ssb and possibly 144MHz fm. Special QSL cards will be sent to all contacts via the bureau. Details from Andrew Muir, G6EIS, Steyning Grammar School, Holland House, Church Street, Steyning, W Sussex BN4 3LB.

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FT-101ZD AM	650.00
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FT-107	725.00
FT-707	569.00
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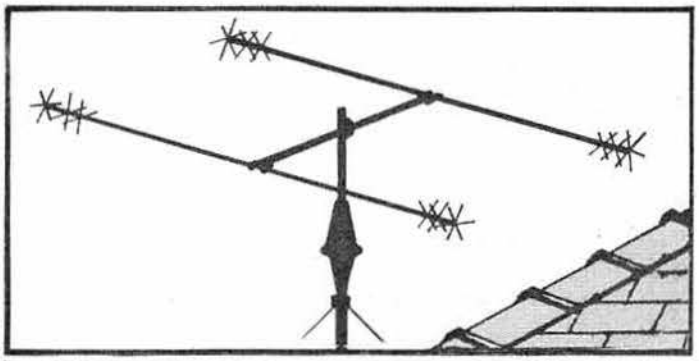

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Element length	11 feet	SWR at resonance	1·5 to 1:00 max
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Turning radius	7 feet	Input impedance	50 ohms
Operating frequencies	10m, 15m, 20m	Wind resistance	80 mph
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TOLERANCES: Up to 800kHz – Total tolerances – ± 100ppm 0°C to + 70°C
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Synthesiser Modulator	MOD 1	8.10	4.75
Bandpass Filter	BPF 433	6.10	3.25
PIN RF Switch	PSI 433	9.10	7.75
Converter (2M or 10M i.f.)	70RX2/2	27.10	20.10
FM Package 1 (Crystal Controlled)	70PAC1	135.00	100.00
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Bipolar Miniature (13dB gain)	70PA2	7.90	5.95
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Kits are available from the following agents:-

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Darwen Electronics, 13 Thorncliffe Drive, DARWEN, Lancs. 0254 771 497.
United Trading AB, Box 16024, 200 25 MALMO, SWEDEN. 040 94 89 55.

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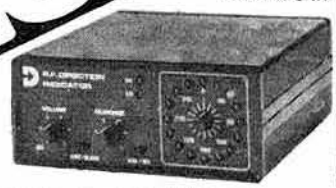
New

MODEL DF
DISPLAY UNIT



DOPPLER DIRECTION FINDER

Model DF is a direction finding attachment for use with existing narrow band FM receivers and transceivers.

Two units, the display unit and the special antenna combiner convert your NBFM transceiver plus four omnidirectional antennas into a radio direction finder. A built-in r.f. activated antenna relay diverts the transceiver's output to the normal antenna during transmit or when the DF attachment is switched off.

Features

- Works with any existing narrow-band FM receiver or transceiver. No modifications are needed. The only connections required are to the external speaker and antenna jacks.
- Gives a clear directional readout on a circular array of sixteen bright green LEDs.
- Display holds last reading when signal drops out.
- Very easy to use and install.
- Only a single coaxial cable needed between display unit and antenna combiner.
- Professional quality at remarkably low cost. Display unit uses two PTH circuit boards. Gasket sealed combiner unit houses two conventional double-sided PCBs.

Applications

Model DF costs between ten and a hundred times less than conventional RDF systems, and therefore opens up new application areas for both professional and hobby users. Possible applications include:- VHF amateur radio, Citizen's Band radio, aircraft spotting, tracking gliders and light aircraft, locating lost model aircraft, private mobile radio systems, coastal and marine radio, tracking and locating anti-social radio operators, locating 'tagged' animals in the wild, helping to identify or trace unknown transmissions, law enforcement.

MODEL DFA2 COMBINER UNIT

A complete system needs the display unit and the antenna combiner plus four antennas mounted at the corners of a square spaced apart by 0.05 to 0.3 wavelengths.

For fixed station use, four dipoles are suitable while four magnetically mounted quarter wave whips are ideal for mobile use. Depending on the choice of antenna, the system will operate from 20 to 200 MHz.

Suitable magmount quarter wave whips are available from Datong for VHF use.

***BASIC DF SYSTEM** (Model DF display unit with Model DFA1 combiner) **£125.00** + VAT **(£143.80)**

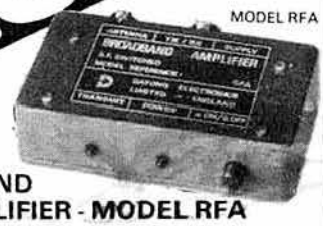
***DF SYSTEM**, as above but with mobile version of combiner, Model DFA2 (as DFA1 but fitted with magmount and 4 metre coaxial downlead terminated with PL259 plug): **£131.00** + VAT **(£150.70)**

COMPLETE MOBILE DF SYSTEM (Model DF display unit, Model DFA2 combiner, and four Model MA1 quarter wavelength magmount antennas cut for 145 MHz): **£173.50** + VAT **(£199.50)**

* Antennas not included

New

MODEL RFA



WIDE BAND PREAMPLIFIER - MODEL RFA

Eliminates separate tuned preamplifiers for each band.

Model RFA improves the sensitivity of any receiver or transceiver working in the range from 5 to 200 MHz. It connects in series with the antenna and built-in r.f. activated relay switches the pre-amplifier out of circuit during transmit or when the power is off.

Features:

- Extra wide bandwidth saves the cost of separate narrow band preamps.
- Handles strong signals without overload thanks to special low-noise negative feedback technique. Intercept point better than + 20dbm.
- Low noise figure.
- Carefully chosen gain level minimises receiver overload and cross modulation.
- R.F. activated bypass relay allows easy use with transceivers.
- Rugged diecast aluminium case with SO239 connectors and PTH printed circuit board.

Applications

Application areas include:- weak signal reception of all amateur and satellite bands from 5 MHz up to 200 MHz, long distance reception of VHF FM Broadcasts and VHF TV Signals, CB transceivers, private mobile VHF radio transceivers, reception of marine and aeronautical bands, VHF scanner receivers, compensating for signal loss in long antenna feeders.

The wide bandwidth of Model RFA makes it ideal for use with broadband antennas and scanner receivers.

Broadband Preamplifier, Model RFA: £25.50 + VAT **(£29.32)**

New

MODEL S
"CODECALL"

"CODECALL" SELECTIVE CALLING DEVICE - TAKES THE FATIGUE OUT OF LONG TERM MONITORING

"Codecall" is ideal wherever there is a need to monitor a well used radio channel for one particular call over long periods. "Codecall" gives the same convenience as a telephone bell, in that the receiver remains totally silent while monitoring. It therefore causes no disruption to other activities.

In fact the user can totally disregard the radio until a loud bleep from "Codecall" warns that the desired signal has been received. The loud intermittent bleep then continues, unless cancelled, for over ten minutes after the call is received.

"Codecall" ensures that the communications channel remains at full efficiency at all times. Without "Codecall" the desired call often blends into the general chatter and is missed by the listener, especially when the volume has been reduced to cut down the radio's nuisance level.

Features

- Each "Codecall" unit acts as a call generator and a call receiver.
- No electrical connection is needed at the transmitter, simply hold "Codecall" next to the microphone.
- At the receiver simply plug "Codecall" into the external speaker jack.
- Over four thousand different codes virtually eliminate the chance of false alarms.
- Internal 9 volt battery has long life since no current is used while monitoring a squelched channel.
- Works over any voice link, whether FM, AM, or SSB.
- Codes selected by either three 16-way switches (Model S) or by altering twelve internal wire links (Model L).
- Compact: only 4 x 2.4 x 1.05 inches.

Two Versions

Model S (as illustrated) has three 16-way rotary switches on the front panel giving a total of 4096 combinations immediately available. Model L has no switches, instead the code is set by altering twelve wire links inside the case.

Both models can be used in the same system. The switched version (Model S) is ideal where frequent code changes are required, whereas the linked version (Model L) is suitable where codes are not likely to be altered often, or for unskilled users who might accidentally set the wrong code.

Note: when used by UK Radio Amateurs all transmissions must be identified as required by the licence conditions.

"Codecall" Model L (Link programmed): £24.00 + VAT **(£27.60)**

"Codecall" Model S (Switch programmed): £25.50 + VAT **(£29.32)**

DATONG ELECTRONICS LIMITED

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★ See text for details.

Data sheets on any products available free on request – write to Dept R.C.

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- Fully synthesised 144-146MHz.
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Well, what can we say about this set? Standard Communications pride themselves on being one of Japan's leading manufacturers of professional VHF/UHF communications equipment with a reputation for excellent quality control, so all their know-how has gone into making a truly remarkable set with all the features anyone could need in a mobile unit (come in and see it for yourself).

£232.00 inc. FREE ANTENNA & SWR METER

–C78–

70cm FM PORTABLE

This has all the features of the C58 and uses the same range of accessories (with the exception of the linear amp) so you only need buy one set for both units. With 70cm getting more popular come in and try one.

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–C58–

2 metre MULTI-MODE

The C58 has all the features possible on a portable rig many of which some mobiles don't have. It's optional accessories allow it to be used in the car with a power output of 25W. Come in and compare this with the FT290, you may be glad you did.

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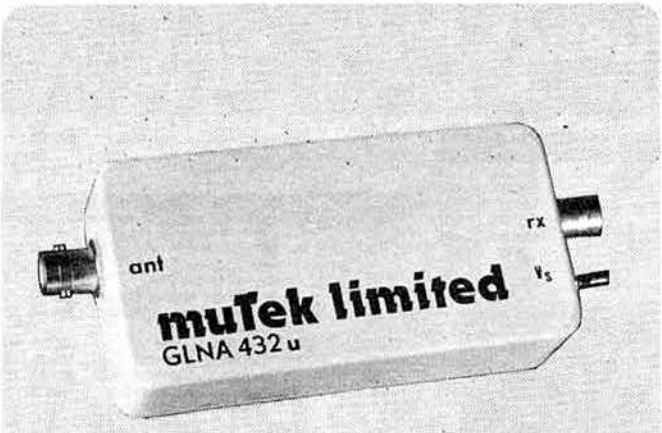

GLNA432u gasfet 432MHz preamplifiers

We're very pleased with the reaction to the new products which we have introduced over the last few months. In particular the feedback that we've received regarding the BBBA 500u has been most encouraging with sales much exceeding our expectations. Thank you!
As many of you who read this will have realised muTek now has one of the most comprehensive ranges of preamplifiers for the vhf/uhf bands manufactured anywhere! One consequence of our determination to specialise in rf technology is that some of our 'competitors' are starting to learn from us – by buying our new products! We were enormously amused to sell a BBBA 500u to a staff member of a company producing a not dissimilar (but rather more limited) product!

Chris G4DGU

GLNA432 u – 1 432MHz gasfet preamplifier 0.8dB nf, 13dB gain typical – **£49.50**
– 2 0.65dB nf version – **£59.50**

This preamplifier, available in two versions: – 1 (0.8dB nf) and – 2 (0.65dB nf) uses a high quality professional gasfet in a teflon-glass stripline (triplate) circuit with helical resonator filtering, giving <1dB gain variation over 430-440MHz, and greater than 25dB rejection at 410 and 470MHz. Both versions exhibit typically 13dB gain. BNC sockets are fitted as standard, although TNC type can be fitted on request (*please* don't ask for SO239's !!).

TLNA432 s – rf switched 432MHz preamplifier – **£49.90**
u – unswitched 432MHz preamplifier – **£24.80**

These preamplifiers are very high quality low-noise bipolar transistor amplifiers covering the entire 430-440MHz band. Their noise measure is typically 1.4dB and they have an associated gain of typically 12dB. The device used is a modern highly linear low-noise transistor providing better performance at uhf than elderly devices such as the NE64535 or consumer gasfets like the 3SK97. We have paid our usual attention to excellent bandpass filtering in this case using helical resonators to ensure superb performance. As it is not possible to retain this order of performance with pin-diode or low-cost relay switching, the switched version uses proper coaxial relays to enable 100w + power handling capability.

SLNA70 s – rf switched 70MHz preamplifier – **£33.90**
u – unswitched 70MHz preamplifier – **£20.38**

Our 70MHz preamps are both versions of our established market-leading SLNA 144 series 2m mosfet amplifiers. Performance figures are substantially as for the 144MHz units with the exception of the bandpass filtering which is even better!

THE REST OF THE RANGE:

SLNA70ub	Unboxed SLNA70u	**£12.41**
SLNA144s	The best rf switched 144MHz mosfet preamp currently available!	**£33.90**
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BBBA500u	20-500MHz broadband high dynamic range preamplifier	**£20.38**
BBBA860u	400-860MHz broadband low-noise amplifier 2.3dB nf/10dB gain at 860MHz	**£20.50**
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Phone for further details or send an sae with your query. Tnx!

All above prices include VAT at 15%.

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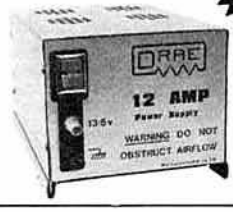

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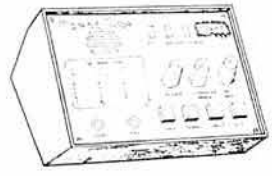

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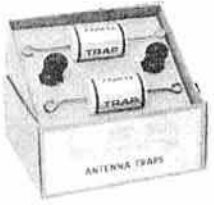

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Three trap kits are now available. 7 MHz for traditional 5-band dipole 80-10m. 3·5MHz covers six bands 160-10m. 18/24MHz for new add-on or separate dipole for 10, 18 and 24MHz. Each set rated 500W and complete with end insulators and full instructions.

7MHz £17.20
3·5MHz £17.20
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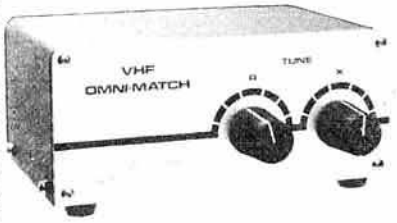
Dipole centre insulator £1.20



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144MHz - 25W - 12½kHz

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- * Ten Memories
- * Custom Micro
- * Memory Scanning
- * Band Scanning

The KDK FM2025E mark II is a 12V DC two metre FM transceiver for mobile or base station use. Although providing an unrivalled number of operational features, operational ease is assured by use of a custom-designed microprocessor.

Digital frequency synthesis provides full band coverage in steps down to 12.5 kHz (12.5-200 kHz possible). Single knob frequency selection is by an optically coupled encoder offering 30 steps per revolution. A dial speed switch increases tuning steps tenfold facilitating rapid QSY (one end of the band to the other in half a turn!!)

Necessary control function instructions are programmed into the microprocessor, but by re-arranging a diode matrix, the lower transceive limit, the maximum transceive and the maximum transmit frequency limits may be set within 140-150 MHz (e.g. TX/RX 144-146 MHz RX only to 148 MHz). Further rearrangements allows the basic step to be changed from 12.5 kHz to 5 kHz. The dial step integer, band scan step and repeater offset are all reprogrammable.

Two five slot "easy write" memories with nicad back-up (drawing 57 nano amps!!) provides 10 simplex (or with ± 600 KHz split) or 5 semi-duplex channels and make the 2025 as easy to use as a crystal control transceiver when mobile. The first memory channel is "semi dedicated" to priority and is programmable even when the transceiver is dial controlled.

The scanner seeks occupied or vacant channels and a flick switch enables immediate transmission. The scanner will examine the memories or search a selected portion of the band as defined by the contents of two memory channels. A zero-centre detector is incorporated to prevent scanning from stopping prematurely before reaching the exact frequency required.

UHF mosfets are used in the RF and first mixer and provide superior intermodulation performance with high sensitivity mantained over the band by automatic varicap tuning. One chip LSI provides all second IF and detector circuits plus AF preamp and ultra-sensitive wide range squelch. A new high level output audio IC has internal protection against over-voltage and shorted output circuits.

A single conversion transmitter uses a balanced mixer and a VCO on the signal frequency directly modulated for superb FM. The high gain power output module gives 25 or 3 watts of RF and will not break down even under an infinite VSWR.

Reliability is a must. The use of LSI has significantly reduced the component count, there are no connectors, sockets, or relays incorporated. If you're in the market for a two metre FM transceiver then see the KDK today . . .

★ **£199** INC. VAT AT 15% AND SECURICOR ★

The KDK 2025 Mk II is available on free finance:
£39 deposit and 6 monthly payments of £26.67 or
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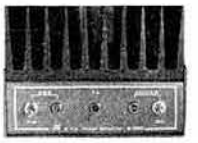
2 METER HIGH POWER LINEAR AMPLIFIER



Further to our announcement in previous advertisements to produce 2 meter linear amplifiers, we have finally designed and manufactured an 80 watt version to suit the most popular QRP transceiver – the Yaesu FT290R, but is also suitable for any other transceiver having an output power of 2-3 watts. (And the price is right too).
This decision was made after a survey amongst our customers who were owners of QRP transceivers their requirements were for a 80 to 100 watt basic amp with no gimmicks such as receive pre-amp which only adds to costs and degrades the noise performance of the receiver.
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Suitable for FM and SSB.
Fully RF switched or can be used via transceivers PTT line.
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Manufactured to high industrial standards. SO239 sockets fitted as standard.
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SPECIAL INTRODUCTORY PRICE OF ONLY £98.00.

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We can supply you with one of our linear amps and a FT290R for an all in price of only **£330.00.** (FT290 accessories extra).
3SK88 MOSFET super low noise 1·1db @ 150 MHz with 26db gain, 16db gain @ 900 MHz with only 3·5db noise, still a good device for 70cms approx 22db gain with 2·2db noise, supplied with data sheet – new REDUCED PRICE ONLY **£1.20 ea.** or **two for £2.20.**
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PLEASE NOTE all sets are sold less crystals unless otherwise stated. Carriage on RT equipment—Mobiles ***£2*** *each. Base stations* ***£15*** *each. Red Star available at cost.*
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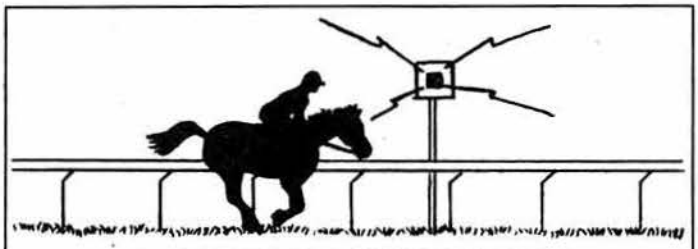

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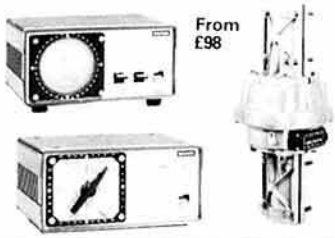

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The optimum synthesizer steps for SSB/CW or FM operation are very different. That's why Yaesu gives you the flexibility of two synthesizer steps per mode: 100Hz or 1kHz per step on SSB and CW, and 12½kHz or 25kHz per step on FM. When changing modes from SSB/CW to FM, your FT290R is automatically set to the nearest standard channel when you start scanning or tuning.

TEN MEMORY CHANNELS
As many as ten frequencies may be stored into memory, for instant recall. The priority feature allows you to check a favourite frequency every few seconds, with automatic halting (FM mode) when the channel is clear or busy, as desired. Memory backup is provided by a built-in lithium cell, with an estimated lifetime of five years.

DUAL VFO SYSTEM
The FT290R features a digitally synthesized dual VFO system which provides tremendous flexibility in day to day operation. For example, one VFO may be set up in the SSB portion of the band, and the other in the FM sub-band, for immediate QSY when changing modes.

CONVENIENT FEATURES
Among the many features adding to the convenience of the transceiver is a built-in telescoping antenna, a high-performance noise blanker, a high/low power switch, and a battery condition meter. A clarifier (offset tuning) allows you to follow unstable or Doppler-shifted signals.

FULL LINE OF ACCESSORIES
See your authorised Yaesu dealer for details of the quality line of accessories. These include the YM49 remote speaker microphone with scanning controls; MMB11 Mobile Mounting Bracket; FL2010 2 meter 10 watt amplifier, FLC11 Leather Carrying Case; and the CSC1 Vinyl Carrying Case, Nicad C-Cells and the NC11C Battery Charger. Stop by and try the FT290R today!!

GENERAL

Frequency coverage:
144-146MHz

Modes of operation:
SSB (USB, LSB), CW and FM

Synthesizer steps:
SSB/CW: 100Hz, 1kHz
FM: 12·5kHz, 25kHz

Power requirements:
8 × C size dry batteries
8 × C size Nicad cells
External: 8·5-15·2V DC
Memory backup: lithium cell

Current consumption:
70m A on receive;
800m A on transmit (2·5W RF, FM)

Dimensions:
58(H) × 150(W) × 195(D) mm, 1·3 kg

TRANSMITTER

Power output:
2·5 watts at 12 volts

Carrier Suppression:
Better than −40dB

Spurious radiation:
Better than −60dB

Unwanted sideband suppression:
Better than −40dB

Tone burst frequency:
1750Hz (other models)

Frequency response:
300-2700Hz (−6dB)

FM Deviation:
± 5kHz (max)

Microphone impedance:
600 Ohms

RECEIVER

Intermediate frequencies:
1st IF 10·81MHz (SSB & FM)
2nd IF 455kHz (FM ONLY)

Sensitivity:
SSB/CW: 0·5 μV for 20dB S/N
FM: 0·25 μV for 12dB SINAD

Selectivity:
SSB/CW: 2·4kHz at 6dB down
4·1kHz at 60dB down
FM: 14kHz at 6dB down
25kHz at 60dB down

Image rejection:
Better than −60dB

Audio output impedance:
8 Ohms

Audio output:
1 watt @ 10% THD

WORKING FOR OUR COMMON INTERESTS—at Yaesu Musen communication equipment is not a sideline but the only business. Over 130 licensed amateurs proudly produce the most diverse product line available, SSB, CW, AM or FM for mobile, portable or base use.

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